

ENDANGERED SALMON RECOVERY PLANS

Y 4. M 53: 103-112

RING

Endangered Salmon Recovery Plans, S..., THE

SUBCOMMITTEE ON ENVIRONMENT
AND NATURAL RESOURCES

OF THE

COMMITTEE ON
MERCHANT MARINE AND FISHERIES
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

THE RECOVERY OF THE ENDANGERED SNAKE RIVER
SALMON AS RECOMMENDED TO THE NATIONAL MA-
RINE FISHERIES SERVICE BY THE SNAKE RIVER
SALMON RECOVERY TEAM

JUNE 30, 1994

Serial No. 103-112

Printed for the use of the Committee on Merchant Marine and Fisheries



U.S. GOVERNMENT PRINTING OFFICE
NOV 16 1994
83-191 CC

NOV 16 1994

U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1994

83-191 CC
U.S. GOVERNMENT PRINTING OFFICE
NOV 16 1994
83-191 CC

For sale by the U.S. Government Printing Office

Superintendent of Documents, Congressional Sales Office, Washington, DC 20402

ISBN 0-16-045934-6

ENDANGERED SALMON RECOVERY PLANS

Y 4. M 53:103-112

ING

Endangered Salmon Recovery Plans, S... THE

SUBCOMMITTEE ON ENVIRONMENT

AND NATURAL RESOURCES

OF THE

COMMITTEE ON

MERCHANT MARINE AND FISHERIES

HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

THE RECOVERY OF THE ENDANGERED SNAKE RIVER
SALMON AS RECOMMENDED TO THE NATIONAL MA-
RINE FISHERIES SERVICE BY THE SNAKE RIVER
SALMON RECOVERY TEAM

JUNE 30, 1994

Serial No. 103-112

Printed for the use of the Committee on Merchant Marine and Fisheries



RECEIVED
LIBRARY
NOV 16 1994

U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1994

83-191 CC

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402

ISBN 0-16-045934-6

COMMITTEE ON MERCHANT MARINE AND FISHERIES

GERRY E. STUDDS, Massachusetts, *Chairman*

WILLIAM J. HUGHES, New Jersey
EARL HUTTO, Florida
W.J. (BILLY) TAUZIN, Louisiana
WILLIAM O. LIPINSKI, Illinois
SOLOMON P. ORTIZ, Texas
THOMAS J. MANTON, New York
OWEN B. PICKETT, Virginia
GEORGE J. HOCHBRUECKNER, New York
FRANK PALLONE, Jr., New Jersey
GREG LAUGHLIN, Texas
JOLENE UNSOELD, Washington
GENE TAYLOR, Mississippi
JACK REED, Rhode Island
H. MARTIN LANCASTER, North Carolina
THOMAS H. ANDREWS, Maine
ELIZABETH FURSE, Oregon
LYNN SCHENK, California
GENE GREEN, Texas
ALCEE L. HASTINGS, Florida
DAN HAMBURG, California
BLANCHE M. LAMBERT, Arkansas
ANNA G. ESHOO, California
THOMAS J. BARLOW, III, Kentucky
BART STUPAK, Michigan
BENNIE G. THOMPSON, Mississippi
MARIA CANTWELL, Washington
PETER DEUTSCH, Florida
GARY L. ACKERMAN, New York

JACK FIELDS, Texas
DON YOUNG, Alaska
HERBERT H. BATEMAN, Virginia
JIM SAXTON, New Jersey
HOWARD COBLE, North Carolina
CURT WELDON, Pennsylvania
JAMES M. INHOFE, Oklahoma
ARTHUR RAVENEL, Jr., South Carolina
WAYNE T. GILCHREST, Maryland
RANDY "DUKE" CUNNINGHAM, California
JACK KINGSTON, Georgia
TILLIE K. FOWLER, Florida
MICHAEL N. CASTLE, Delaware
PETER T. KING, New York
LINCOLN DIAZ-BALART, Florida
RICHARD W. POMBO, California
HELEN DELICH BENTLEY, Maryland
CHARLES H. TAYLOR, North Carolina
PETER G. TORKILDSEN, Massachusetts

JEFFREY R. PIKE, *Chief of Staff*

MARY J. FUSCO KITSOS, *Chief Clerk*

HARRY F. BURROUGHS, *Minority Staff Director*

CYNTHIA M. WILKINSON, *Minority Chief Counsel*

SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

GERRY E. STUDDS, Massachusetts, *Chairman*

GEORGE J. HOCHBRUECKNER, New York
FRANK PALLONE, Jr., New Jersey
GREG LAUGHLIN, Texas
JOLENE UNSOELD, Washington
JACK REED, Rhode Island
ELIZABETH FURSE, Oregon
DAN HAMBURG, California
BLANCHE M. LAMBERT, Arkansas
ANNA G. ESHOO, California
EARL HUTTO, Florida
W.J. (BILLY) TAUZIN, Louisiana
SOLOMON P. ORTIZ, Texas
BENNIE G. THOMPSON, Mississippi

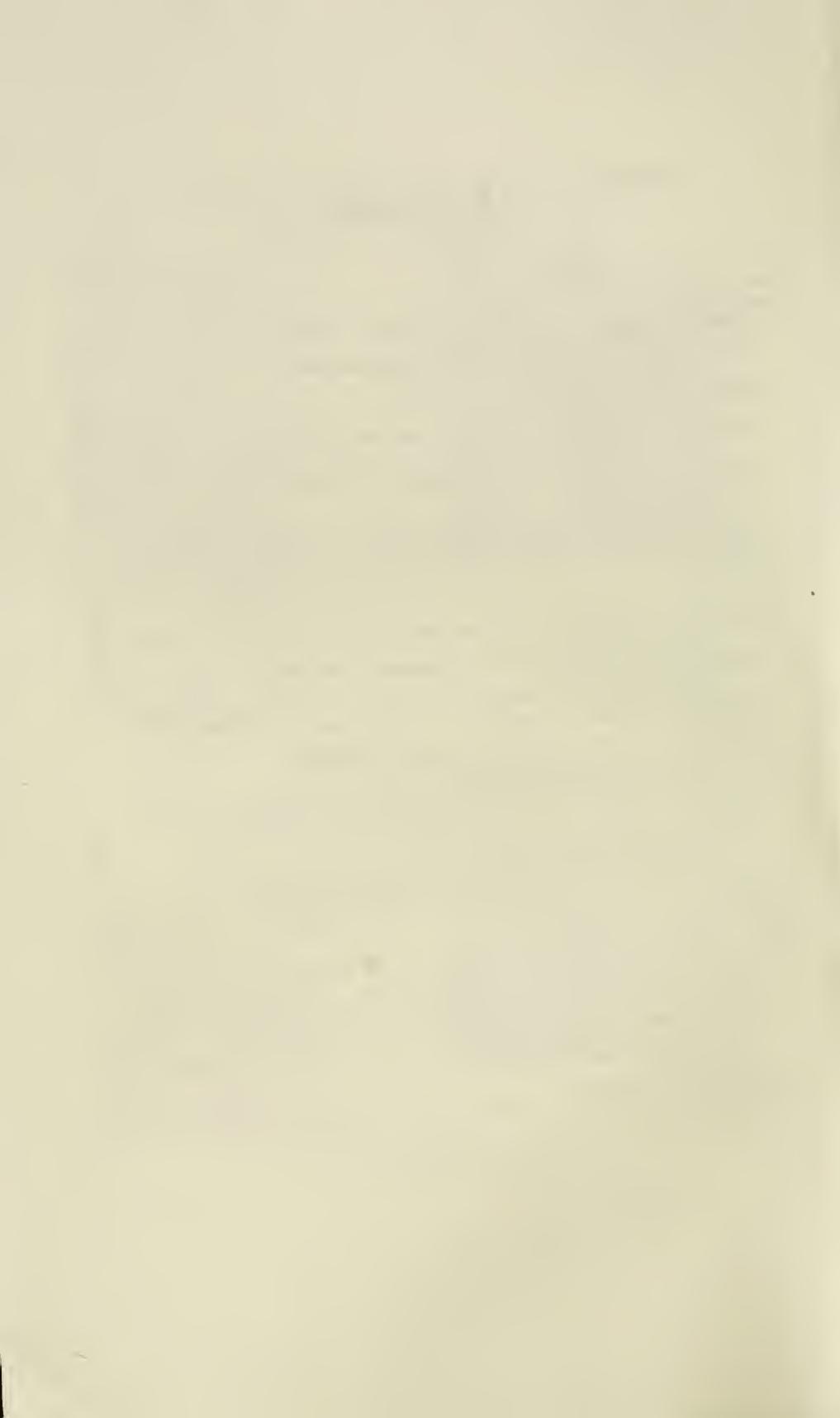
JIM SAXTON, New Jersey
DON YOUNG, Alaska
CURT WELDON, Pennsylvania
ARTHUR RAVENEL, Jr., South Carolina
WAYNE T. GILCHREST, Maryland
RANDY "DUKE" CUNNINGHAM, California
MICHAEL N. CASTLE, Delaware
CHARLES H. TAYLOR, North Carolina
JACK FIELDS, Texas (Ex Officio)

DANIEL ASHE, *Staff Director*

KAREN STEUER, *Deputy Staff Director*

CONTENTS

	Page
Hearing held June 30, 1994	1
Statement of:	
Bakke, Bill, Director of Resource Conservation, Oregon Trout	41
Prepared statement	245
Bevan, Donald, Chairman, Snake River Recovery Team	10
Prepared statement	75
Bodi, Lorraine, Co-Director, American Rivers	36
Prepared statement	201
Bottiger, Ted, Chairman, Northwest Power Planning Council	8
Prepared statement	53
Cantwell, Hon. Maria, a U.S. Representative from Washington	15
Crapo, Hon. Michael, a U.S. Representative from Idaho	3
Prepared statement	5
Fields, Hon. Jack, a U.S. Representative from Texas, and Ranking Minority Member, Committee on Merchant Marine and Fisheries	7
Furse, Hon. Elizabeth, a U.S. Representative from Oregon	2
Hamilton, Liz, Executive Director, Northwest Sportfishing Industry Association	44
Prepared statement	257
Holt, Levi, Vice-chairman, Columbia River Inter-Tribal Fish Commission	11
Prepared statement	112
Lovelin, Bruce, Executive Director, Columbia River Alliance	34
Prepared statement	174
Saxton, Hon. Jim, a U.S. Representative from New Jersey, and Ranking Minority Member, Subcommittee on Environment and Natural Resources	8
Schmitthen, Rollie, Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration	13
Prepared statement	163
Studds, Hon. Gerry E., a U.S. Representative from Massachusetts, and Chairman, Subcommittee on Environment and Natural Resources	1
Tienson, Thane, Counsel, Salmon for All	39
Prepared statement	231
Unsoeld, Hon. Jolene, a U.S. Representative from Washington	2
Wright, Al, Executive Director, Pacific Northwest Utilities Conference Committee	43
Prepared statement	253
Additional material supplied:	
Bevan, Donald (Snake River Recovery Team): Final Recommendations to the National Marine Fisheries Service	78
Backman, Thomas W.H., and Laura Berg (Columbia River Inter-Tribal Commission): Managing Molecules or Saving Salmon?—The “Evolutionarily Significant Unit”	153
Schmitthen, Rollie (NOAA): Follow-up answer to question by Representative Unsoeld	269
Communications submitted:	
Roberts, Barbara (Governor of Oregon): Letter of June 27, 1994, to Hon. Gerry Studds	270



ENDANGERED SALMON RECOVERY PLANS

THURSDAY, JUNE 30, 1994

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES, COMMITTEE ON MERCHANT MARINE AND FISHERIES,

Washington, DC.

The Subcommittee met, pursuant to call, at 10:14 a.m., in room 1334, Longworth House Office Building, Hon. Gerry E. Studds presiding.

Present: Representatives Studds, Hochbrueckner, Pallone, Unsoeld [Co-chair], Furse, and Cantwell [Co-chair].

Staff Present: Sue Waldron, Press Secretary; Frank Lockhart, Professional Staff; Marvadell Zeeb, Subcommittee Clerk; Dan Ashe, Staff Director; Margherita Woods, Minority Assistant; Sharon McKenna, Minority Subcommittee Counsel; Cyndy Wilkinson, Minority Chief Counsel; and Tom Melius, Minority Professional Staff.

STATEMENT OF HON. GERRY E. STUDDS, A U.S. REPRESENTATIVE FROM MASSACHUSETTS, AND CHAIRMAN, SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

Mr. STUDDS. The salmon of the Columbia River are legendary. When they arrived at the River early in the 19th Century, Lewis and Clark remarked, "The multitudes of this fish are almost inconceivable...at this season they float in such quantities down the stream, and are drifted ashore, the Indians have only to collect, split and dry them on scaffolds." Today, instead of salmon, the only things that exist in inconceivable multitudes on the Columbia are conflicting interests, competing jurisdictions, and failed recovery attempts.

However, the situation is not as bleak as it may appear for two very important reasons. First, the people of the Northwest have let it be known that they wish to recover salmon, and according to a recent poll of the Washington State citizens, they are willing to pay a reasonable amount to do it. Second, salmon are one of nature's most resilient and persistent creatures. If any species can come back from the brink of extinction, it is the salmon. Luckily, we can depend on both of these factors in the development of a recovery plan.

Towards that end, the Snake River Recovery Team recently delivered to the National Marine Fisheries Service their final recommendations to recover endangered Snake River salmon. From this point on, the fate of these salmon rests with the Service and the Endangered Species Act recovery planning process. The testi-

mony presented at this hearing should get us off to a good start. The distinguished gentlewoman from Washington.

**STATEMENT OF HON. JOLENE UNSOELD, A U.S.
REPRESENTATIVE FROM WASHINGTON**

Ms. UNSOELD. Thank you, Mr. Chairman. As a number of witnesses indicate, this is an issue of enormous importance to the Pacific Northwest. For thousands of years the native salmon stocks of the Pacific Northwest have not only sustained our many peoples and cultures but entire societies that have revolved around these extraordinary fish.

Recently, however, the numbers of native salmon returning from the sea to their birth waters have declined dramatically. Over harvesting, degradation of spawning habitat, hydroelectric dams, and natural disasters such as drought and the El Nino current have all contributed to the alarmingly low numbers of adult salmon returning to native waters to produce another generation of magnificent fish.

Indeed, many runs of salmon are now seriously threatened, endangered or extinct. While the Columbia River has been a lightning rod for conflicts over appropriate restoration actions, solutions are needed regionwide, ecosystem wide. As stewards of these resources, we can no longer ignore the warning signs. We must respond aggressively to this situation and support activities that promote long-term sustainable fisheries.

Many, many long hours have been dedicated to developing strategies for salmon recovery in the Columbia River. The question on everyone's mind is, can we rise to the enormous challenge and work together to restore our salmon or will our differences result in a gridlock, court-imposed management and attempts to legislate a solution?

To those of us who experienced the spotted owl conflict, the latter choice appears to be a *deja vu* all over again. Mr. Chairman, I am very, very grateful to you for initiating this hearing and allowing these people who are intimately involved with this issue on a daily basis to be here.

I look forward to our witness' views on these important issues. Thank you very much.

Mr. STUDDS. Thank you. The distinguished gentlewoman from Oregon.

**STATEMENT OF HON. ELIZABETH FURSE, A U.S.
REPRESENTATIVE FROM OREGON**

Ms. FURSE. Mr. Chairman, I want to thank you personally for accommodating the wishes of the Committee's Northwest members by calling for this hearing. It is of the utmost importance to my district and the entire Pacific Northwest. Your attention to this issue is deeply appreciated.

The rivers of the Pacific Northwest, as you mentioned, Mr. Chairman, once flowed so thickly with the spawning salmon that people used to say you could walk across the water on their backs. As many as 16 million salmon would return to the Columbia River each year making a herculean effort to migrate 900 miles upstream.

These legendary fish form the cultural, economic and ecological backbone of the Northwest. As recently as 1988 the recreational and commercial salmon fishery contributed more than \$1 billion annually to the Northwest economy and provided an estimated 60,000 jobs in the region.

The Pacific Northwest tribes rely as they have through time im-memorial on the salmon for the commercial subsistence and religious activities of their people. Salmon are the defining symbol of the Northwest. But the salmon are in trouble. They are returning to the spawning grounds in record low numbers and three Columbia River basin stocks are already listed under the ESA.

Our commercial salmon fishery was recently closed for the first time in our State's history and this closure has prompted the Administration to announce a \$15.7 million disaster relief assistance package.

It is clear that we must take action and we must take it now or we will lose our salmon forever. What is less clear is exactly what strategy should be pursued. Millions of dollars have already been spent in recent years to recover the salmon but these efforts have failed to stop their decline.

The time, it seems to me, has come to stop fighting among ourselves. We need a creative, bold regional recovery plan. We must allow the rivers to heal. We must create again the habitat for salmon production. Every interest will have to make a sacrifice in order to solve this problem. There is no more time for special interests. There is only time for solutions.

So we have convened you, the experts on the issue, to give us your best ideas on the route we should take to reach the road to salmon recovery. I am eager to hear your ideas. How we address this issue is critical, not only to the Columbia River, but to the entire Northwest because how the recovery process progresses in the Columbia River Basin will set the stage for salmon recovery throughout the region where stocks are equally troubled.

I thank you, Mr. Chairman, for your attention and I look forward to the testimony.

Mr. STUDDS. The gentleman from New Jersey, do you have a statement? We welcome our colleague from Washington, Congressman Dicks, to sit with us like a member of the Committee.

Mr. DICKS. Thank you, Mr. Chairman. I appreciate you having this hearing.

Mr. STUDDS. We are pleased to have you here. I hope you will come more often. We will go first to our colleague, Congressman Michael Crapo from Idaho. Mr. Crapo, welcome.

STATEMENT OF HON. MICHAEL CRAPO, A U.S. REPRESENTATIVE FROM IDAHO

Mr. CRAPO. Thank you, Mr. Chairman. Mr. Chairman, I have submitted some written remarks and would request that they be made a part of the record of this hearing.

Mr. STUDDS. Without objection. Please feel perfectly free to be as brief as you wish.

Mr. CRAPO. I would appreciate that. I understand how this works. Mr. Chairman, as another member from the Northwest, I too appreciate this Committee holding these hearings and I appre-

ciate the opportunity to testify and give the remarks that I give from the perspective of one from Idaho.

I also would recognize that there are many experts here and I hope that they are going to be able to shed some light on the kinds of solutions that we need because it truly is time that we move from the discussion of the issue to a determination of hard solutions and specific decisions about what needs to be done.

Last year and this year I have been focusing on wilderness issues in Idaho among many other issues, but one of the things that has come out in those hearings, whether they be town meetings or other meetings that I have held on the wilderness issue, is that the people in Idaho also want to restore the rich heritage that we have in our salmon.

As I held those town meetings, people from almost everywhere agreed that we must take the steps necessary to restore the salmon. It was interesting to me that in the town of Salmon, Idaho, which was named after these great runs of the salmon who made it back up into that habitat, there were those who had spent their lives for generations of families logging, working in the grazing industry, working in the mining industry and so forth who could remember the great, rich heritage of the salmon runs and wished that they could have them back.

People from every perspective recognize that there is the need and they state their willingness to do their part. Their concern, however, is that politics may play more a role in the solution than science and it is our concern to make sure that this Committee, that those who work on this issue focus on what will work rather than what is politically expedient.

One of the things that I want to talk about today is the issue of water. There are some who had suggested that the way to solve the problem is to simply flush the river with water from Idaho. Let me tell you a little bit about the water.

The Salmon Recovery Plan issued by the National Marine and Fisheries Service is based on the 1994-1998 Biological Opinion which was issued. That opinion calls for 85,000 cubic feet per second (cfs) at Lower Granite Dam from April 20 through June 20; 55,000 cfs at Lower Granite Dam from June 21 through July 30; and 50,000 cfs at Lower Granite from July 31 through August 10.

The Opinion also calls for 427,000 acre-feet to be released from the Brownlee Reservoir and 1.5 million acre-feet from the Dworshak Reservoir. The opinion requests that Federal agencies take an additional 400,000 acre-feet above Hell's Canyon by 1999.

In addition, a study being funded by the Bonneville Power Administration is looking at nonstructural means to deliver 1 million acre-feet below Lower Granite Dam for salmon. This all depends heavily on water, much of it Idaho water. And yet, in our current situation the water is not available.

We are currently in our seventh out of approximately eight years of drought and even if you look at the projections for the flows meeting if all the water were taken it would be difficult to meet these projections and that assumes that you could simply ignore the needs of the people in agriculture or in other industry or simply the needs of people who live in the Snake River plain.

My concern and the point that I want to make clear is that those who would focus on a purely flush type solution or a solution which would assume that we can by putting more water in the upstream part of the river simply make the trip of the salmon faster to the ocean, are ignoring many other parts of the problem.

We must have a solution which focuses on all aspects of the problem and which does not devastate any particular group of people or industries. The farmers in Idaho are very willing to play their part. In fact, on a willing buyer/seller basis they have already come up with an ability to provide hundreds of thousands of acre-feet of water to assist in the solution for salmon runs.

The point that I want to make is that there are other parts of the problem. Dams on the lower Snake and the Columbia are recognized, I think, to be one of the most significant parts of the problem and the manner in which we help the fish survive going around the dams and make it to the ocean is critical.

A recent study completed by Bookman Edmunston Engineering Firm, funded by Bonneville Power contends that to shift 1 million acre-feet of water from agricultural uses would take 450,000 to 590,000 acres of Idaho agricultural land out of production.

The direct and indirect income losses in southern Idaho would be estimated to be between \$500 to \$670 million in income and between 10,000 and 14,000 jobs. That is the kind of impact that we could be facing if we just look at one piece of the solution and ignore other pieces of the solution.

Although there are no easy answers, I don't believe it is practical, realistic or scientifically achievable or economically sensible for the region to expect that sufficient water will be available in the upper reaches of the Snake River to simply flush the fish past the dam.

We have got to have a more broad approach. It is my contention that we need to continue to pursue the facts and the arguments to find honest, unbiased, scientific answers to these questions and I hope that all parties involved will work together to craft a solution to this issue.

All possible solutions should be thoroughly studied and tested and we must all work together if we are to avoid the serious economic damage to the Pacific Northwest which will not necessarily be that beneficial to the salmon.

Therefore, I urge accelerated focus on using our resources to come up with a consensus among all parties involved including the Indian tribes and the State Government and I would be glad to submit to your questions.

[Statement of Hon. Michael Crapo follows:]

STATEMENT OF HON. MICHAEL D. CRAPO, A U.S. REPRESENTATIVE FROM IDAHO

Mr. Chairman, thank you for allowing me to testify before the Subcommittee. Due to the aggressive schedule of the Subcommittee, I will keep my remarks brief.

Few would disagree that we must restore and preserve the salmon; salmon are a rich part of Idaho's heritage. As I held wilderness town meetings across the second congressional district, people from almost every perspective agreed that we must take steps to restore the wild salmon runs. The heartfelt fervor of the testimony was particularly meaningful when it came from those who could recall earlier days when salmon runs were strong and plentiful. These people, many of whom have logged timber, grazed livestock, and raised crops for generations, stated their willingness to do their part in salmon restoration.

While there is considerable disagreement about the proper action necessary to protect and restore Snake River wild salmon, I come here today to discuss the impact that the Salmon Recovery Plan would have on the economy and well being of the State of Idaho.

The Salmon Recovery Plan issued by the National Marine and Fisheries Service is based on the 1994-1998 Biological Opinion.

The Opinion calls for 85,000 cubic feet per second (cfs) at Lower Granite Dam from April 20 through June 20; 55,000 cfs at Lower Granite Dam from June 21 through July 30; and 50,000 cfs at Lower Granite Dam from July 31 through August 10. The Opinion also calls for 427,000 acre-feet to be released from Brownlee Reservoir and 1.5 million acre-feet from Dworshak Reservoir.

The Biological Opinion requests that Federal agencies take an additional 400,000 acre-feet above Hells Canyon by 1999. In addition, a study being funded by Bonneville Power Administration is looking at nonstructural means to deliver one million acre-feet below Lower Granite Dam for salmon. This all depends heavily upon Idaho water—water that is simply not available.

Mr. Chairman, water is Idaho's most precious resource and the people in Idaho prosper with the utilization of this resource. The State of Idaho has had drought conditions in 7 out of the last 8 years. The flow requirements outlined in NMFS' Biological Opinion are not feasible in these drought conditions.

In 1994, the conditions for meeting flows are nearly impossible and it would take the entire water storage in southern Idaho to meet the demands for water flow in the Biological Opinion. In fact, the projected water flows for the months of July and August are only 25,000 cfs or less and 15,000 cfs or less, respectively, in the Snake River near Lower Granite Dam.

The Soil Conservation Service is only predicting 40 to 50 percent runoff from snow pack and streamflows for the months of July and August. The Biological Opinion directs that 50,000 cfs be available for the months of July and August. This comes to approximately 3.6 million acre-feet. Since only about half of this amount will come from projected water flows, the rest will have to come from the 8.1 million acre-feet in storage for agricultural interests.

A recent study completed by Bookman Edmundston Engineering Firm, funded by Bonneville Power Administration, contends that to shift one million acre-feet of water from agriculture users would take 450,000 to 591,000 acres of Idaho Agriculture land out of production. The direct and indirect income losses in southern Idaho are estimated between \$500 to \$670 million in income and between 10,500 and 14,000 jobs. The Biological Opinion will have Idaho Agriculture release 3 million acre-feet of water from irrigation storage. The direct impact on the Idaho economy will range from \$240 million to \$750 million each year. Idaho can not withstand an economic hit of this size.

Although there are no easy answers, it is neither practical, realistic, scientifically achievable, nor economically sensible for the region to expect that sufficient water will be available in the upper reaches of the Snake River Basin to "flush" the salmon through the system. A flush would seem to have little or no positive effect on the survivability of the fish.

I do know that the solution can't be based solely on large volumes of Idaho water. The solution must be balanced, in terms of available water and based on multiple methodology.

It is my intention to continue to pursue the facts and the arguments to find honest, unbiased, scientific answers to these pressing questions. I hope that all parties involved will work together to craft a solution to this issue. All possible solutions should be thoroughly studied and tested. We must all work together if we are to avoid both serious economic damage to the Pacific Northwest and the loss of the salmon.

I therefore urge an accelerated focusing of resources to come up with a consensus solution among all the parties involved, including the Indian tribes and State Governments.

Thank you, Mr. Chairman.

Mr. STUDDS. I thank you very much. Are there questions for our colleague from Idaho? The gentlewoman from Washington.

Ms. UNSOELD. Granted that the lake in Idaho should not be the sole item that we look to to solve this, but it should be part of the solution, wouldn't you agree?

Mr. CRAPO. Yes, Mr. Chairman, and Ms. Unsoeld, I definitely agree that all parties need to participate and as I indicated, if you

look at the past few years as the efforts have been underway to find solutions and to test different approaches, you will see that those involved in agriculture who are the ones who are in most of the front line hit with regard to Idaho's water right, now have already made major efforts.

The Idaho legislature has actually changed its law on a temporary basis for a test to allow water which was under our law dedicated solely to agricultural uses to be diverted to be used for assisting in the solution to the salmon problem to see if it would work and I can tell you that the Idaho agricultural community is ready to do its part.

What they are asking is that they simply not be focused on as the sole portion of the solution.

Mr. STUDDS. Any other questions? I want to thank you very much. Your full statement will appear in the record. I suppose that I should confess that in the mid-1970's when we were writing the Fisheries Conservation and Management Act as a sophomore from New England I had to inquire why the State of Idaho would be in a fisheries management council.

I gather if we had written this act 50 years before that we would have to put Montana on it as well.

Mr. CRAPO. That is correct. That is correct, Mr. Chairman.

Mr. STUDDS. This is an awesome creature.

Mr. CRAPO. The salmon runs in Idaho which, has been said, are dwindling, are one of the greatest environmental treasures that we have lost and our people truly do seek to have them restored.

Mr. STUDDS. We thank you very much. Without objection, the statements of the gentleman from Texas, Mr. Fields, and the gentleman from New Jersey, Mr. Saxton will be placed in the record at this point.

[Statement of Hon. Jack Fields follows:]

STATEMENT OF HON. JACK FIELDS, A U.S. REPRESENTATIVE FROM TEXAS, AND RANKING MINORITY MEMBER, COMMITTEE ON MERCHANT MARINE AND FISHERIES

Mr. Chairman, our hearing today will focus on possible solutions for recovering Columbia River salmon stocks that have been listed by the National Marine Fisheries Service (NMFS) under its authority from the Endangered Species Act.

In response to listing the Snake River's sockeye salmon as an endangered species in 1991, the National Marine Fisheries Service (NMFS), under its authority in the Endangered Species Act, appointed a recovery team to develop a recovery plan for the species. When two additional stocks (fall and spring/summer chinook) were listed as threatened in 1992, the recovery team's responsibilities were expanded to include these species. The team's final recommendations were forwarded to NMFS on June 14, 1994. Other organizations have also prepared plans for salmon species. These include a Strategy for Salmon developed by the Northwest Power Planning Council and, most recently, a Tribal Restoration Plan developed by the tribes in the Northwest.

NMFS will review these plans as well as other recommendations and develop a final recovery plan for endangered and threatened salmon species. The final recovery plan will not be self-implementing, though it will be used as a guide for various agencies in refining their management plans, procedures, and strategies.

Our hearing coincides with the initial stages of development of a final recovery plan by NMFS for the threatened and endangered species in the Columbia River. The hearing will review issues that are relevant to the recovery of the species throughout their life cycle. This includes spawning and rearing habitat, downstream survival, transportation systems around impediments in the river, predation, harvest, and upstream survival around dams.

I look forward to hearing the testimony from the various witnesses today as we seek a better understanding of this issue.

Thank you, Mr. Chairman.

[Statement of Hon. Jim Saxton follows:]

STATEMENT OF HON. H. JAMES SAXTON, A U.S. REPRESENTATIVE FROM NEW JERSEY, AND RANKING MINORITY MEMBER, SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

Mr. Chairman, I want to thank you for holding this hearing today on an issue that, at first glance, would seem to have very little to do with my State of New Jersey and its fisheries resources. But the institutional changes in the National Marine Fisheries Service to respond to the Pacific Northwest salmon crisis could have a significant impact on New Jersey fishermen.

I look forward to hearing in detail from our witnesses about the process "NMFS" will use in developing a comprehensive recovery plan. I also welcome Congressman Crapo of Idaho, who brings specialized knowledge of this issue after years of addressing it on the State level.

Thank you.

Mr. STUDDS. I am going to ask the first panel, four people, to come forward as a group and as they do so express my apologies. My own obligations preclude my remaining much longer. I am going to ask the gentlewoman from Washington to take the chair if she will.

Ms. UNSOELD. We will take the panel participants in the order in which they appear on the agenda so Mr. Bottiger, you are first.

STATEMENT OF TED BOTTIGER, CHAIRMAN, NORTHWEST POWER PLANNING COUNCIL

Mr. BOTTIGER. Congresswoman Unsoeld, thank you very much. My name is Ted Bottiger and I am the chairman of the Northwest Power Planning Council and I want to thank you for the opportunity to testify in this oversight hearing on the Columbia River basin salmon stocks.

The Committee asked three questions. Your first question asks whether the Recovery Team's recommendation will lead to the recovery of listed stocks and I am sure that Dr. Bevan will concur that there are substantial biological uncertainties that make it impossible to answer that question with certainty.

Full implementation of the Team's recommendations and the council's salmon strategy provide the best hope for not only recovery but for rebuilding to levels that will support a sustainable fishery.

Your second question asks if there are alternative approaches that would increase the likelihood of recovery. I will discuss more in a minute but the council will be reviewing a number of additional salmon survival improvements this summer and fall.

We are undertaking this review because we have acknowledged that the existing measures in our salmon strategy are by themselves insufficient to protect all weak stocks or to rebuild fishable levels.

Your third question concerns the essential elements of a recovery plan. We believe that a recovery plan must improve salmon survival at all stages of the life cycle. We believe, however, that an effective recovery effort must also go beyond the immediate listed stocks if we are ever to get off the endangered species treadmill.

In addition, as noted in our written statement, we have other legal mandates that include the Federal Clean Water Act, tribal

treaty rights guaranteed in the 1885 treaties, and the rebuilding obligation of the Pacific Salmon Treaty with Canada that must be addressed in the Columbia River Basin.

These will require measures beyond those needed to remove the Snake River listed salmon stocks from the endangered species list. Your questions also focus on recovery planning for Snake River salmon but I assure you that the problem is much greater and it is not limited to just those fish.

In the Snake River only about 600 naturally spawning spring chinook salmon returned to spawn above Lower Granite Dam this year. That is an all time low and the predictions for the coming summer and fall stock are no better.

Salmon runs on the upper Columbia or the main stem are also very low this year and they have been petitioned for listing under the Endangered Species Act. What I am saying in short is the Snake River Recovery Team's plan is an excellent plan for the Snake River but the problem is bigger and it is coming to us in the train wreck that Vice President Gore mentioned.

Our problem is in excess and the existing strategy for salmon by the Power Council is a recovery plan in place for the whole basin. It needs to be upgraded and added to and we will be doing that this summer.

We also intend to take proposals from all interested groups, run them through our public involvement process and be able to report to you and Congress of the results of that. We know there are many reasons for the decline of the salmon stocks and we can't limit our recovery efforts to just dams or to just water as the Congressman mentioned.

We have overharvesting, we have poor hatchery practices, and we have declining habitat, all of which must be addressed in order to have any kind of a recovery plan with a chance of succeeding.

The recovery efforts must continue to address all of these problems while the National Marine Fishery Service prepares its recovery plan. We can't afford to delay waiting for "another plan to come." And I hope it doesn't become an excuse for people to not do their part in the interim.

The comprehensive design of the plan is designed to enhance all Columbia River stocks including those being protected under the Endangered Species Act and the region must continue to implement the strategy while the Marine Fisheries Service prepares a recovery plan.

The Council appreciates the work of the Recovery Team. We are already willing to work with them and the Fisheries Service to ensure the effective implementation of salmon recovery measures but in order to be an effective partner the States and the Council must be involved in the Section 7 consultations with the Federal agencies.

These consultations on dam operations, hatcheries, harvest, and habitat concern impacts on salmon that we directly address and the States, through the power planning councils, simply must be given a meaningful participatory role.

The governors have requested this and it can be done with the stroke of a pen. Meanwhile we continue to refine the strategy for salmon. We acknowledge that when we prepared that strategy the

near-term measures we included would not be enough to protect all of the weak stocks or to rebuild to levels that would provide the benefits of a sustainable harvest.

We called for careful detailed investigations for additional measures and this summer those reports will be coming in. We would ask that the congressmen who are interested in this subject join with us in finding a solution to the salmon of the Pacific Northwest. Thank you very much, Mr. Chairman.

[Statement of Ted Bottiger can be found at the end of the hearing.

Ms. UNSOELD. And as with all witnesses your entire written testimony will be incorporated into the record. Mr. Bevan, you are next on the agenda.

STATEMENT OF DONALD BEVAN, CHAIRMAN, SNAKE RIVER RECOVERY TEAM

Mr. BEVAN. Thank you, Ms. Unsoeld. Members of the Subcommittee, ladies and gentlemen, I am Donald E. Bevan, chairman of the National Marine Fisheries Service's Snake River Recovery Team and with your permission I would like to enter into the record a summary document of the plan.

Ms. UNSOELD. Without objection.

Mr. BEVAN. The complete plan, some 500 pages, is available from the National Marine Fisheries Service. I would like to begin my presentation by a quotation from that summary document which is on page 24.

"The recovery of Snake River salmon is a difficult and complicated public policy issue. It is important to achieve recovery and ultimately reap the social, cultural and economic benefits of restored salmon populations. It is also important to do so in an organized, scientifically based and economically efficient manner."

We believe the Team's recommendations do just that and that they are the basis for achieving recovery. We also believe that in combination with the Power Planning Council's strategy for salmon that we now have a regional solution to our salmon problems.

Are there differences between our plan and the Northwest Power Planning Council's strategy? Yes, there are, but we do not believe that in most cases they are significant and where there are differences there almost have to be different interpretations of uncertain science and we are not going to know the truth until we proceed and measure carefully. An important part of our recovery plan is to evaluate as we go along and be prepared to change direction if we are not correct.

I think that my major comment on what Mr. Bottiger just said, the only problem with the strategy for salmon is that it hasn't been implemented and we simply need to get on with the job and not argue over the differences on how we do that.

We can't wait for better science, there isn't time. Some of these animals are going to be extinct if we don't turn things around. One of the attractive new techniques, new technology, which is now available certainly has to be utilized and that is some new statistical tools, some new technological tools on marking fish that allow us really for the first time to get very accurate measures of survival in the river.

It is important to measure what happens by the return of the adults two years after they go to sea but when those fish come back the measure of what has happened to those fish is confounded by half a hundred different treatments that they have received including recently very large changes in the climate of the ocean.

You can't separate out what is the result and what were the benefits of the techniques that you tried to apply if you wait for fish to come back although that is the final measure of the total of all of your recovery actions.

We have got to begin recovery and develop science, better science, as we go along. There are 12 chapters in our document and my mathematics tells me that is about one minute for every hundred pages so I won't try to summarize the document but I would like to talk a little bit and it is maybe out of place for me as a scientist to talk about public policy and politics and institutions.

But it is the Salmon Team's view that our Chapter 3 on institutional changes is an absolute essential if we are going to recover these animals. There are institutional changes recommended. We feel that someone has to be in charge. We recommend the National Marine Fisheries Service, mainly because they have the power of the Endangered Species Act.

We find down the river there is no priority for investment decisions. The regional, State and tribal plans present a vast array of different proposals, some of them in conflict with the others and because of this complexity quite often we see the lowest common denominator is what we try to use for consensus and quite often we can't reach consensus.

We have to have a mechanism in place to move ahead if we don't have consensus. Consensus is fine. It is to be achieved if we can but we can't stop everything because we can't achieve it. We recommend as a very essential part of NMFS being in charge an independent salmon oversight committee, people of science that can give NMFS advice and try to sort through the conflicting views that we have on the river today.

We think that public policy decisions should be made in public. We think that NMFS should establish a data base of the important data that we are using to make decisions. That is not the case on the river today. It is very difficult even for the Salmon Recovery Team to get certain data and some of what we thought was essential information simply doesn't exist.

Finally, I would like to say that the Team thinks it is terribly important to consider all of these recommendations as a whole. We shouldn't divide up recovery among institutions. Thank you, Mr. Chairman, I will be happy to answer any questions that you may have.

[Statement of Donald Bevan can be found at the end of the hearing.

Ms. UNSOELD. Thank you very much, Don. Mr. Holt, vice-chairman of the Inter-Tribal Fish Commission.

STATEMENT OF LEVI HOLT, VICE-CHAIRMAN, COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

Mr. HOLT. Thank you, Madam Chair, and thank you members for this honor and the opportunity on behalf of the Columbia River

Inter-Tribal Fish Commission to present our views and concerns. As stated, my name is Levi Joseph Holt. I am a member of the Nez Perce Tribal Executive Committee and chairman of the Nez Perce Fish and Wildlife Committee.

I would like to submit, Madam Chair, for the record, I believe they have been provided; two documents, Managing Molecules or Salmon and the Pacific Salmon document by Mr. Daniel Rawl as well as, Madam Chair, a comparison of the Columbia River salmon plans.

Ms. UNSOELD. Without objection.

Mr. HOLT. Thank you. First of all, Madam Chair, I would like to state again that on behalf of the Columbia River tribes I think it is useful at this time to remind both this Committee and its members that the tribes are very concerned about the issue of responsibility and trust responsibility that has been guaranteed and upheld under several court dockets and treaties that keep in trust the health and safety of the salmon.

In consequence we now share in this resource with the United States. We did not give up our right nor abdicate our responsibility to the salmon as a result of these treaties. Any recovery plan as Dr. Bevan has stated in marking a program that is provided, somewhat desecrates and somewhat destroys the spiritual and the strength of the salmon.

Handling and marking of the fish or of the species prior to their journey down the river does pose a problem. It is unfortunate that we do not monitor to some degree the ocean fisheries in order to tell the impacts of those particular harvest or destruction by the hydro systems.

And, Madam Chair, I might state that the hydro system must be overhauled. Salmon need flows. They appear to do quite well in high flows that occurred prior to the dams going up and we do applaud the increase fills to aid the downstream migration of the spring and summer chinook.

No matter what anyone else tells you spill levels were not unprecedented. Substantially higher spills occurred in the early 1980's and we saw better return ratios at that time. The hatchery systems on the Columbia River developed ostensibly to mitigate for the damage of salmon runs must be changed to rebuild naturally spawning salmon runs, not just to feed certain ocean fisheries.

This means putting fish back in the habitat and restoring runs where the damage was done. The tribal recovery plan, Madam Chair, and there is a plan, is under internal review and will soon be made public and we will provide further tribes' plans for restoration.

Our program for supplementation is consistent with the Endangered Species Act. We believe NMFS' proposal and even their definition of what exactly is the species is inconsistent with the ESA. The articles that I have provided for the record will explain how this is possible and why the ESA concept proposed by NMFS to define species will not allow for the recovery of salmon.

The land and water habitat management system must be overhauled to provide for the needs of the salmon. Logging throughout the whole watersheds must be salmon-friendly. We cannot continue

to allow to trample the spawning and rearing habitat in the tributaries.

Water withdrawals must be limited to the amount available above what the salmon need to thrive. The tribal recovery plan will address these and many other areas that we believe management should be putting in perspective.

We speak of Bonneville Power Administration's account and their efforts in the past and we note that over \$1 billion has been spent for fish and wildlife under the regional act. There appears to be little benefit in return for their efforts.

When we speak in these terms, we wonder exactly where those particular efforts can be demonstrated to prove any benefit. How does the tribal recovery plan propose to deal with harvest? We believe that once that recovery plan's potential and the proposed actions have been met, the abundance of salmon and the support of the salmon will provide for healthy fisheries.

Madam Chair, I am prepared to answer any questions. Thank you for this opportunity.

[Statement of Levi Holt can be found at the end of the hearing.

Ms. UNSOELD. Thank you, Mr. Holt. The next panelist is Mr. Rollie Schmittten, Assistant Administrator for Fisheries, NOAA. Rollie.

STATEMENT OF ROLLIE SCHMITTEN, ASSISTANT ADMINISTRATOR FOR FISHERIES, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Mr. SCHMITTEN. Chairwoman Unsoeld and members of the Subcommittee, I am Rollie Schmittten, the Assistant Administrator for Fisheries of the National Oceanic and Atmospheric Administration, within the Department of Commerce.

I am pleased to be here this morning to discuss the recovery of salmon stocks in the Pacific Northwest that are listed as both threatened and endangered under the Endangered Species Act.

Foremost I would like to take this opportunity to recognize the hard work and literally hundreds of hours of effort of the Snake River Salmon Recovery Team. The Team has addressed many of the difficult issues since it was formed in 1991 and I can commend them on the recommendations that they have developed and submitted to the Fisheries Service.

I would like to make three points today. First, the Snake River recovery plan is a part of a larger effort to conserve and rebuild all salmon stocks. We support the efforts to address the situation comprehensively through the development of both basin-wide and regional plans.

For example, we are an active participant in the President's Northwest Forest Plan, for Federal forest lands, as well as the pacfish initiative developed by the Forest Service and the Bureau of Land Management. Both of these are guided in part by an aquatic conservation strategy that will protect salmon habitat. It is through these types of ecosystem approaches that we feel the greatest long-term benefits can be attained.

Second, given the variable biological and physical conditions in recent years, it is necessary to adopt actions which will affect other

users of the river to assure recovery of salmon stocks but as earlier indicated, no single water user should carry the burden of recovery.

Consider the following; this is the seventh consecutive drought year in the Snake River Basin and runoffs are expected to be less than 50 percent of normal. There is little likelihood this year of meeting the summer flows established in a Biological Opinion.

Coast-wide, the 1994 harvest of chinook salmon is 84 percent below 1982. The Snake River spring and summer chinook run return in 1994 may be the lowest ever. Runs which averaged 20,000 fish from 1986 to 1990 are predicted to come back at 1,900 fish.

Also consider the fact that all chinook arriving at the Snake River will be down around 200 fish, the level that led to listing this stock. These factors and others resulted in the closure of all ocean fishing off the State of Washington and most of Oregon, something that I thought in my 17 years as a fisheries manager I would never see.

In addition, both Oregon and Washington are proposing to eliminate nearly all commercial fisheries in the lower Columbia River. Third, I am convinced that the Team's recommendation plus other information will provide us the basis for developing a plan that will lead to the recovery of these listed species.

The procedure that we will follow is, before issuing a final plan, publishing for public comment a proposed Agency plan including an analysis, a side-by-side comparison, of what the Agency recommendations are compared to the recommended Team recommendations.

We agree with the Team's conclusion that a myriad of different factors affect the survival of salmon and that no single solution will lead to recovery. We also agree that the recovery plan must be flexible. It must allow for modifications based on new scientific evidence.

Further, we believe that addressing any single factor in isolation likely will not lead to recovery. We agree with the Team that science, I repeat science, must be the predominant consideration in recovery planning decisions.

However, the importance placed on developing new information does not diminish the need for making timely decisions. Using the best available information is mandated by the Endangered Species Act. In the face of scientific uncertainty, and considering the precarious status of many of the salmon stocks that I have just outlined, recovery measures accompanied by careful monitoring and evaluation should be implemented without delay and modified as new information indicates appropriate.

The National Marine Fisheries Service has adopted recovery plan guidelines that provide a framework for developing recovery plans for species under the ESA. The recovery plans will be based upon the biological requirements of the species necessary for timely recovery.

Let me also indicate that in those plans we must by law identify the cost of the measures to all affected parties, develop a schedule for implementation of each measure and identify the parties responsible for implementing them. These are elements that were not requested of the Team in their recovery plan and we are currently

developing that information for inclusion in the proposed and final plan.

In conclusion, we encourage and continue to encourage as we have for the last two and a half years all affected parties to continue to contribute to the identification and development of recovery actions.

In fact, I personally believe that the participation by affected parties, whether they be from tribes, States, the conservation community, or industry, is the most essential ingredient for recovery of salmon stocks.

Madam Chairman, I thank you for the opportunity and I certainly look forward to addressing any questions that you and the Committee may have.

[Statement of Rollie Schmitten can be found at the end of the hearing.]

Ms. UNSOELD. Thank you to all the panel. Since we began my colleague from Washington State, Maria Cantwell, has arrived, and I wonder if you have an opening statement that you wanted to enter at this point before we have questions.

Ms. CANTWELL. Thank you, Madam Chair, I will submit that to the record in the interest of time.

[Statement of Hon. Maria Cantwell follows:]

STATEMENT OF HON. MARIA CANTWELL, A U.S. REPRESENTATIVE FROM WASHINGTON

Mr. Chairman, I want to thank you for holding this hearing today on Columbia River salmon recovery and for your interest in exploring issues affecting northwest salmon resources. The hearing today will provide an excellent opportunity to review past efforts on salmon recovery and to determine our future course of action.

With the Endangered Species Act listings of the Snake River sockeye, Snake River fall and spring/summer chinook, and a number of other salmon species being petitioned for listing, the future of a resource that has defined the Pacific Northwest for centuries is uncertain. Strong, science-based action must be undertaken to address impacts on this vital resource and to restore it to self-sustaining levels.

I am glad to have the chance today to discuss the final recommendations of the Snake River Salmon Recovery Team, along with the recommendations from the Northwest Power Planning Council's Strategy for Salmon and Northwest treaty tribes. The National Marine Fishery Service (NMFS) will be reviewing the work of the Recovery Team, and others to develop a final recovery plan by the end of the year. We are at an important juncture.

Mr. Chairman, 3 years have passed since the Snake River sockeye were first listed under the ESA, and 2 years since the chinook listings. Now is the time to examine carefully how we are responding to a resource in crisis. I hope today to look not only at the contents of the various recovery recommendations, but also at the process of how recovery plans are developed.

I look forward to hearing testimony from today's witnesses. There is significant expertise and experience in this room, and I believe we will gain some much needed insight on the salmon recovery process from these witnesses. Once again, Mr. Chairman, thank you for your work on behalf of this important Northwest issue.

Ms. UNSOELD. Thank you very much. I note that you suggested that you will publish in the **Federal Register** the draft recovery plan this fall, Rollie. One of the difficulties that I believe we have had with the forest plan is that we had expectations things were going to move faster than they actually did.

What are the jaws of reasonable expectation for having a recovery plan in place?

Mr. SCHMITTEN. We have stated for the last six months that our goal, and I will state that it is simply a goal, is to have a recovery

plan by the end of the year and we have assigned and committed the necessary staff to do that.

Now there are without a doubt variables that can affect that. Certainly these include new information, information provided by the tribes and others when we go out for public comment, as well as the finalization of the negotiations before Judge Marsh. Should those variables, and they very likely could, require modifying the schedule, it could be extended for unknown periods of time, but our goal remains the end of the year.

Ms. UNSOELD. Are there items in the Snake River Recovery's final recommendation that concern you or that you believe NMFS could not adopt in their final recovery plan?

Mr. SCHMITTEN. We just received the plan on the 12th, and we started the technical analysis of all 500 pages. Let me state for the record that certainly the Team addressed all the necessary issues as has the regional Power Council.

Are there items at this point that we immediately would object to? I can't identify those. There are certainly some that we would modify and there are some that we have differed on throughout time and those deal with the issue of flow on flow survivals.

Ms. UNSOELD. Mr. Bottiger, do you agree with Dr. Bevan that the Snake River Salmon Recovery's final recommendation coupled with the Northwest Power Planning Council's plan provide a truly regional recovery strategy for salmon?

Mr. BOTTIGER. Yes. As Dr. Bevan has mentioned, there are areas where there is disagreement and the reason there is disagreement is there is adequate science to have come to two different conclusions. His Recovery Team went one way, the Council went another but we could flip flop based on the science next week.

The changes are not that big. The differences I mean are not that big.

Ms. UNSOELD. And how would you comment on the tribal plan?

Mr. BOTTIGER. I haven't seen the tribal plan unless it is DEFOP.

Ms. UNSOELD. So that would require more time before you could respond.

Mr. BOTTIGER. Yes, I don't believe they have released it for the public. One other thing I would like to add; Dr. Bevan is correct when he says that all of the Council's recovery plan is not being implemented. That is right. But about 90 percent is and it is—

Ms. UNSOELD. I want to step in to some really dangerous waters. Hopefully, we are not going to be swept downstream here but in your written remarks you suggest that the Council is concerned that the salmon oversight committee proposed by the Recovery Team would duplicate a measure in the strategy for salmon and be too focused on the Endangered Species Act.

Would you elaborate for me what you mean by that because I think it is a very serious issue with which we haven't totally come to grips.

Mr. BOTTIGER. Dr. Bevan and I discuss this regularly and I hope you give him a chance to tell us—

Ms. UNSOELD. I may have to do it on the second round.

Mr. BOTTIGER. There is nobody in charge in the river and that is correct, there is a diffused structure of control of the river from

Bonneville Power Administration to the Corps of Engineers to NMFS to U.S. Fish and Wildlife, to the States, to the tribes.

The solution to center all of that in the single NMFS Federal agency is the Recovery Team solution. The Council's solution is to force these people together. A scientific oversight group for NMFS is the Recovery Team recommendation of 5 who would give NMFS direction and be appointed by NMFS or I guess nominated by the existing Recovery Team and then what authority do they have over a Federal agency? I don't know.

We think it is too centered on the question of the Endangered Species Act, as you mentioned, and I think you fail to realize that there are resident fish and wildlife problems that are affected by salmon recovery strategies.

If you drain down a reservoir and flush the food supply of the resident fish out now you got another partition so this thing sinks together.

Ms. UNSOELD. My time has run out but I will come back to the other panel members in the second round to pose some more questions. Now my colleague from Oregon.

Ms. FURSE. Thank you, Madam Chair. Dr. Bevan, the governor of Oregon, Barbara Roberts, wanted to be here but was unable to and submitted testimony instead. I have a question I would like to ask on her behalf because it is something that concerns me as well.

She says, and I quote, "I am deeply concerned that the Team's recommendation identifies virtually no specific actions other than the unproven strategy of massive barging to be taken in the near term to avoid loss of these critically depressed salmon populations."

Now her comments seem to contradict your own testimony which talks of the need to expeditiously get on with the job and not delay because of agencies, institutions and individuals without clear scientific direction arguing over what needs to be done. I quote from your testimony.

How do you reconcile your comments with the Governor's observations and do you think that the recovery actions that the Team has proposed will take place soon enough to be of use? It is a critical timeframe that she is speaking of.

Mr. BEVAN. I guess I can only reply that I have to agree with the Governor's comments. I think that those who think that this plan is status quo simply have misunderstood the details of the plan.

We have many, many immediate changes, changes in operation of the dams, changes in structure of the dams, changes in harvest that are considerable based on what has been going on in the last few years.

As far as recommendations on habitat, we have run into situations where things are going on that strictly are against Oregon State law or Idaho State law or Washington State law and those things can be fixed immediately and should be.

On the habitat question, Congressman Crapo said earlier that habitat is important in Idaho and we need to do something about it. They have lots of habitat without any fish and on the other hand you see people in the upper river last year when the water was low using salmon gravel with bulldozers to berm up diversions

to make sure that they could get their water when the supplies were very low.

So I am sorry to say I don't agree with the Governor. I think that we have a plan that is definitely not the status quo. We may not know exactly what is going to work and what isn't and it is our view that we can't wait for any better science.

We have got to go ahead with what science we have now and develop new science as we go along and I think in some respects there is time to do that with major issues. When you plan moving concrete in the river that takes time, it takes appropriations and we have got time to gather better information.

Next year may be the last year that we have large numbers of wild fish going down the Columbia River for a few years to come and we simply have to take advantage of next year to gather the kind of information to settle some of these differences of opinion.

Ms. FURSE. Madam Chair, if I may. Mr. Holt, you mentioned that the Bonneville Power Administration has already spent \$1 billion on fish and wildlife recovery. In your view, how will the tribal restoration plan differ from the Power Council and the BPA efforts? How will your plan be more effective than those other plans?

Mr. HOLT. The tribal recovery plan plans on revisiting some of the tributary restoration strategies that have initially been sought after and in fact in 1981 the tribes proposed a tributary restoration strategy.

At that time we were met, of course, by opposition by BPA who put restrictions on our program. BPA had focused at that time more in the planning and research rather than the implementation.

BPA's focus, in fact, on planning rather than action caused the region to waste valuable time as well as money and we cite now today that in fact we must hurry and visit and discover and verify and to qualify new science but we believe, in fact, that those strategies, those sub-basis plannings of some 31 sub-basins in the Columbia that are sited under the tribal restoration plan will provide for a comprehensive approach.

Plans will be aimed at implementing the rights that our treaties have preserved and we feel already that much science and study has already been done well beyond the means and the time that we have available to us.

Ms. FURSE. Thank you. If I may ask Mr. Schmitt just one question. Judge Marsh recently invalidated the jeopardy standards. The Federal, State and tribal agencies have jointly filed a schedule and process for establishing new jeopardy standards.

Will NMFS' recovery plan reflect those new jeopardy standards that results from this process?

Mr. SCHMITTEN. You are correct that Judge Marsh has indicated the assumptions and the opinion need to be reevaluated. Included in that are both the base period; the differences are distinction between recovery, survival, life cycle, modeling and jeopardy, all of which are technical issues that we do hope to resolve with the community and would be a part of our recovery plan.

Ms. FURSE. Thank you. Thank you, Madam Chair.

Ms. UNSOELD. The other gentlewoman from Washington is recognized.

Ms. CANTWELL. Thank you, Madam Chair, for recognizing me and for holding this hearing today. I applaud your leadership in this issue and working here with my colleagues to really try to resolve some of the very tough issues relating to this issue.

It is interesting because some of our same panelists appeared out in Portland almost a year ago when Congresswoman Furse and Congresswoman Unsoeld encouraged the chairman to hold a hearing on this very same issue, and while I think that we have made some progress in dialog and coordination, I think that the problem has grown much more complicated and larger as we have gotten more organized.

Anyway I would like to direct my questions to Dr. Bevan and perhaps get Mr. Bottiger to continue to elaborate on his testimony. Really my questions come as your recommendations from the Recovery Team on this salmon oversight committee that would be within NMFS.

As I read it, you are making several recommendations but the Team would be an independent five-member oversight committee and be formed to fill critical decisionmaking void that we are all talking about here.

As I read your recommendations they would be working with all interested parties to ensure conformance with goals and objectives of the recovery plan to make certain that relevant permits and biological opinions issued by NMFS are consistent and to resolve jurisdictional disputes, provide oversight for recovery plan implementation and advise the National Marine Services when changes are required in the recovery plan and then coordinate the scientific subgroups.

Dr. Bevan, is this oversight committee making this recommendation with real teeth, i.e., are we making a recommendation that this committee in coordination with NMFS have the real power—I mean when you start talking about relevant permits and biological opinions and conformance with goals and objectives I guess I am coming from my State experience of two and a half years in designing the Growth Management Act and the hearings board process and exactly how you put teeth into a planning process.

Are we describing this with real intent for this committee to have teeth or are we talking about just a coordinated advisory role and new leg or arm within NMFS?

Mr. BEVAN. I think my answer to that is that we think the teeth and the power of these decisions ought to rest with the Federal agency, the National Marine Fisheries Service. And I don't know a kinder way to say this, the Team views that National Marine Fisheries Service needs some independent advice in making those decisions.

This would be an advisory committee, not a committee making decisions. It would try to use some of the existing committees that are in existence. As an example of how things might work, I think I can use the recent what I might call ruckus on the river as to what is the importance of gas bubble disease, nitrogen super-saturation.

There is vast disagreement on that question from a number of different agencies, both Federal, State and tribal and the National

Marine Fisheries Service gathered a group of experts from around the country on gas bubble disease.

They met last week and it is my understanding that they will be issuing a report; maybe it was issued yesterday or today, on the impacts and the risk in the Columbia River to gas bubble disease.

We would look upon that as a kind of subcommittee that the salmon oversight committee would use in order to give NMFS independent advice. We think that the system has broken down over the years where there is too much argument among agencies without critical evaluation by experts on the science that ought to be used to make the decision.

We are simply saying we ought to use science, we need a science-based group to give NMFS advice but NMFS is going to be the decisionmaking body in our view.

Ms. CANTWELL. So you would see this oversight committee in an independent advisory role but what would happen then if the oversight committee gave an advisory opinion that NMFS might disagree with—I would just like to be clear, are we talking about advisory or are we talking about de facto?

We want the process to work and I am one that believes that we definitely need more coordination and more specification.

Mr. BEVAN. I see it as advisory but on the other hand I see a committee with enough stature in the community, with enough respect in the region that if NMFS doesn't want to take their advice, that group such as this one will recognize those differences and in the long run we have got to have a body of people that are expert, that, as I say, have the respect.

I look upon this committee as being former judges, former governors, scientifically based in large respect but one that has the respect of the region and the NMFS I think will be unlikely not to take their advice but they certainly have no power, in our view.

We don't see how you can set up a structure of that kind without changes in the law.

Ms. CANTWELL. Thank you, Madam Chair. I would love to explore this further but my time has expired and perhaps on the next round or perhaps you will get to Mr. Bottiger before I will.

Ms. UNSOELD. Thank you. I join in the welcome that Chairman Studds gave to my colleague from Washington State. Although I have not had the pleasure, it might not be pleasure, but I have not had the opportunity to be in a fishing boat with him.

I know that he comes to this issue from not the theoretical but from the real experience. Mr. Dicks.

Mr. DICKS. From the sports and recreational and actually from the benefit of having been on a purse-seiner for two years working my way through law school.

I just want to commend our chairman and the members here for this hearing and I want to commend all the members of our panel for the excellent testimony. I just wish you had more time to be able to go into more detail.

I will ask this of the panel. One of the major conflicts has been the question of barge transportation, taking these fish down by barges versus I guess additional flows or spills, whatever draw downs in the river system.

What are the pros and cons of this and why is this such a difficult issue between the parties out there? Could you go through that for me? Maybe, Don, you could start and then, Ted, whoever else wants to comment.

Mr. BEVAN. Mr. Dicks, it is difficult for me to see why it is a difficult issue. If we look at the science and the science is not perfect, it indicates that barging at the present time is better than the conditions in the river.

Mr. DICKS. And the way you do it is you gather the fish and then you take them down on a barge, then release them?

Mr. BEVAN. Now does the Team look upon barging as a long-term solution? No, we don't. We think that as soon as you can improve conditions in the river so that they are at least equal to barging, there is no need to do barging but they definitely are not at the present time.

Mr. DICKS. What do you have to do in the river? What are some of the things you would be describing that need to be done?

Mr. BEVAN. The main thing in the river I think is spill and flow augmentation but carefully done and carefully understood. Spill, there is no question, that is the best way through a dam. It is even better than barging around a single dam but once you spill over a dam you put those fish back in the reservoir and experience and measurement tells us right now that that is a very dangerous place to have fish.

I look upon transportation a little like I would having a loved one in the hospital hooked up to an IV system. It is critical care and it is not something that you want to do permanently. You want to get your loved ones home but you don't accomplish that by going to the hospital and shutting off the switches.

Transportation in the short term simply is a safer way until we prove that it is not, and the evidence is that it is safer, then we should keep that as a major recovery tool. Again, I wouldn't want to do 100 percent of anything. I wouldn't want to have 100 percent of fish in barges during bad conditions like we have this year.

I wouldn't want to have 100 percent of the fish in the river during good flow conditions. I would want to be able to measure both and know what is happening. We haven't been doing that.

Mr. BOTTIGER. If I could explain it this way, I don't think I disagree with anything Dr. Bevan said. Barging in low water years is better than leaving the fish in the river. In good water years it is probably better to discontinue the barging.

That is current practice. That is what we do now. But something happens in barges and none of us know why. If we protect them from all the predation, if we protect them from the turbines, if we protect them from everything else, the warm water while they are in a barge, why don't more come back than currently do?

We are seeing two-to-one benefits barging over in river in a low water year but you would think there would be 10 or 20 times more barge fish come back and they don't so something is happening. It may be overcrowding, it may be disease spreading. There is something going on in the barges that needs fixing.

Mr. DICKS. And we don't really have the scientific information to know what that is, Dr. Bevan?

Mr. BEVAN. We have the ability to get it. The almost crime is that we are not doing it. This year, for example, we have no pit tags in barges and yet we have got a tremendous—

Mr. DICKS. Who runs the barges, the Corps of Engineers?

Mr. BEVAN. The Corps of Engineers runs the barges. We are suggesting—

Mr. DICKS. And they have simply not done the scientific monitoring and assessment over the years to give us this information?

Mr. BEVAN. Well, I am not sure that the Corps by itself should be the ones responsible for carrying on that scientific measurement.

Mr. DICKS. This is what bothers me. When everybody is responsible, nobody is responsible. This is what bothers me about this whole thing and that is why I might take a little exception with my good friend, Ted Bottiger, with this idea that we can let everybody run the river.

I don't think it will work. I think we are so far in trouble now that we got to have some strong central authority and then let everybody participate in an open process in trying to come to a conclusion, but somebody has to make a decision and there has to be scientific monitoring and assessment done that has never been done over the history of this.

And I ask people, well, who is in charge? Well, Oregon Fisheries used to do it or Washington Fisheries used to do it. I mean the bottom line is we have run this thing without the benefit of science and I remember getting involved in this problem when I was on the staff of Senator Magnuson back in 1970.

We tried to do a lot of these things. We started the screening of the turbines and blips-blips, barging, all that stuff started in that timeframe but nobody did the assessment, the monitoring to give us an understanding of what worked and what didn't work.

And so somebody has to be in charge here. I think if Congress has to come to grips with this somehow we have got to get some lines of authority. I certainly want the Power Council to be involved. They have done a great job, they have a good strategy but we need to have someone who is going to put together a budget who can get the agencies to work together and marshall the forces here.

I think if we let this thing drift along we are never going to get an answer. I will just throw that out for comment.

Mr. HOLT. If I may revisit the original question. In tribes' mind, the barging obviously is not the answer. The results and the mortality on the species is yet to be understood. Our frustration in that regard is the lack of an ability or the obstruction or hindrance of allowing the tribes to understand the cause of the mortality.

We do agree that when conditions provide flow and spill the augmentation of such should be provided.

Mr. DICKS. Well, what do you do about nitrogen, super-saturation, so-called gas bubble disease?

Ms. UNSOELD. The gentleman will get an additional round. We will allow him to answer that question and then we will make another cycle.

Mr. HOLT. And I will get to that. It is the frustration again that the Corps in operation of the barging somewhat is providing a

cover, if you will, for the mortality problems and we do understand that in Dr. Bevan's mind if a patient, for instance, is hooked to an IV that may be the best solution for providing protection and the best care but unfortunately we know even those systems are flawed and again the barging needs to be studied, it needs to be verified for mortality.

And as far as those particular conditions on nitrogen and the other saturations, we too have problems and we do have concerns that this saturation as stated is not exactly as high as being provided for by other agencies.

Ms. UNSOELD. Thank you, and we will have a second round. Rollie, it is clear that good people have difference of views on some of these issues and probably part of the reason for that is the dearth of data.

What are your plans, research plans, to fill in all of that missing information so that we can make the decisions that are based on a little more than our gut feeling?

Mr. SCHMITTEN. I can think of three areas in which the Agency needs to begin, and has begun, additional studies.

One, we have been relying on studies of survival in the years 1981 through 1993. Last year was the first year since 1981 that contemporary science has been used to analyze the relationship between survival and flow rate.

The other issue is transportation. It seems that if the community at large is going to rely on transportation at least for an interim period of time we should examine how to improve that system. I mean that is again a scientific matter, and I think there is agreement even in the Columbia Basin Fish and Wildlife Association, which represents States and tribes at certain levels, that transportation is allowable.

The third area is an area that my Agency has attempted, and really we have a need to get out in front of, and that is both ocean survival conditions and estuarine conditions. In these last two years we have seen a tremendous decrease in our fishery stocks and where we have tracked carefully through the river systems somewhere we are losing these fish. We happen to believe that with Congress' help we have gotten on top of the high-seas drift net interception so something is occurring scientifically that we have to find out.

I guess I will add a fourth point—the most significant thing affecting salmon stocks today: if we lose our salmon, it will be because we have not done something about habitat. It is the single most important element that faces fish and when you get outside of the confines of the Columbia system and the effects of hydro-power it is a habitat issue.

Ms. UNSOELD. Dr. Bevan, you have expressed dismay in the past as you got into your job of coming up with a recovery plan at the lack of data. Are there additional areas from what Rollie mentioned that you discovered were totally lacking in our understanding of the situation as you came into the job?

Mr. BEVAN. Yes, Ms. Unsoeld. Let me just give you just a couple of examples. One is a common data system. In 1985 when we negotiated the U.S.-Canada treaty, both parties agreed to set up a coastwide salmon data system. That has not yet been done.

Ms. UNSOELD. In 1983?

Mr. BEVAN. 1985.

Ms. UNSOELD. 1985.

Mr. BEVAN. Yes. That is relatively inexpensive. I receive a foot of faxes almost in a month these days on Columbia River data. I can't analyze that unless I enter into my computer bit by bit. That could be put on an electronic network available through Internet for almost the cost of sending out the faxes.

We are in a modern world where we need to have public decisions be based on public data so that an informed public can understand the reasons for the decisions. That is very difficult to do today.

Another example of the need for information. Much has been said of flushing the fish to the river. My good friend and colleague, Professor Percy, of Oregon State spent a lot of time on the ocean a decade ago and so did my colleague, Alan C. Hart.

They developed quite a bit of information on where the salmon were in the North Pacific, how they went out through the plume of the Columbia and where are Professor Percy and Mr. Hart today? They are not out there working anymore. And what is worse, nobody else is.

We have really taken our focus away from the river. That is so important. Professor Percy has a hypothesis. It is not important to flush the fish down the river, what is important is to flush them from the estuary out into the ocean through a band of very dangerous conditions.

Is he right? I don't know, although I suspect he has some evidence that indicates to me that he may be, but the important question is he has posed a hypothesis. We contest it. We can go out and measure whether that is an important part of the life cycle and see what happens when you speed up fish going through the initial parts of the ocean.

Ms. UNSOELD. Ted, my time is running out but do you want to add anything about studies, data that need to be gathered?

Mr. BOTTIGER. Well, there are two problems. One is, you have a whole series of conflicting scientific opinion and the stack of—I mean it is almost easier to weigh it than it is read it and it comes in pretty even, so what is a policymaker supposed to do in a decision like that?

That is where both the Council and the Recovery Team agree there has got to be a Scientific Oversight Committee that directs the study, the hypothesis the doctor mentioned. We have two under consideration now. One is transportation and one is the benefit of flows.

Directing that science to solve these questions is, I think, awfully important.

Mr. DICKS. Would you elaborate on that point?

Ms. UNSOELD. Well, my time is up. If the gentlewoman from Oregon will delay taking her set of questions we will let you pursue that one just as a follow-up.

Mr. DICKS. As I understand it, we asked Bonneville to fund a certain amount of work on the system. Have we asked that this kind of science be funded?

Mr. BOTTIGER. Yes.

Mr. DICKS. And they have simply not done it?

Mr. BOTTIGER. It is one of the things that is not done in the implementation of the Council's program. We asked Bonneville to set up a scientific review group. On page 10 and 11 I discussed Dr. Bevan's point and it is done here.

We agree such a group should be formed. It is the control and the function but getting the science—you put 10 of these guys in a room and you get 15 opinions. You put seven in a room and you get 10 opinions.

Mr. BEVAN. If I might add to that, Mr. Dicks, it depends on the 10 people you put in the room. We put 10 people in a room last week on gas bubble disease, people from Inter-Tribe, people from Federal agencies, people from around the country, and they got through with a day's worth of work and they had no disagreement and there was no minority report.

I think that is possible. Our Recovery Team worked for two and a half years. We never took a vote. We had, as some in the diplomatic language say, spirited discussions but we always were able to agree on what the science told us.

Ms. UNSOELD. Thank you. Ms. Furse.

Ms. FURSE. Thank you, Madam Chairman. It is my understanding, Mr. Holt, that tribes co-manage the Columbia River under a treaty and law with the United States and Oregon and Washington. Could you tell me whether you believe as the vice-chairman of the Inter-Tribal Fish Commission whether you believe the tribes' views were incorporated and there was adequate consultation in the development of the Recovery Team Plan?

Mr. HOLT. Thank you. It is the feeling and the view of the commission that the consultation, if you will, had not been met and we believe that that is a direct right under the sovereignty of a nation, particularly the tribes.

We have felt that we have been excluded in that process which has somewhat prompted the tribes to develop their own restoration plan. Some areas of our direction and recommendation under our plan are similar to the Recovery Team's effort and I think some of the areas such as habitat and the upgrading and the restrictions and moratoriums, etc., are mirrored to some degree.

But to be quite direct, no, and quite honest we believe we have been excluded and we would like that opportunity to again take the time to review the Recovery Team's plan as well as they are most eager, I am sure, to get a hold of the Tribal Restoration Plan.

We think that any direct consultation that we should be guaranteed has not been upheld.

Ms. FURSE. Thank you. Rollie, do you see that as a future direction, you will be looking to consult and—

Mr. SCHMITTEN. Absolutely. In fact, as I outlined the process of putting the recovery plan out, it will go out for public comment. We don't necessarily have to do that, nor is it normally done that way. In fact, we have conducted this entire process through probably the most open process ever used in conducting an ESA listing.

It has even served as a prototype for the Secretaries of Commerce and Interior to indicate that they want more of this openness. We have set up technical review committees in which the

tribes and States served on to advise us, we set up economic review committees, again the same groups.

I think the difficulty though, and someone has raised this, has been when it comes down to section 7, which is by law a Federal responsibility, and I have suggested ways of even opening that up further. We need community involvement.

Ms. FURSE. And the Federal relationship to the tribes will be part of that. I would like to ask Dr. Bevan one question. The Fish and Wildlife Service commissioned a Team to review the government's salmon transportation program and they have just published this report. It was released in May.

The first sentence in the conclusion section reads, "As presently conceived and implemented, transportation is unlikely to halt or prevent continued decline and extirpation of listed species of salmon in the Snake River Basin."

That seems to contradict your views on barging. Could you comment on those apparent—

Mr. BEVAN. Surely. First, I don't think it contradicts our views. I think we agree with Dr. Mundy on that statement. We don't think that there is any measure that will by itself recover these salmon and we have to look at the wide range of different things in the life history.

I have very carefully read Dr. Mundy's report. I have to say that I didn't really understand what that report was about until I got back to the conclusion on page 120 and I don't think the executive summary does a very good job of summarizing his conclusions.

I think that he and I would agree that there is no major difference between what the Team is saying and I think Dr. Mundy, and he should speak for himself, I think Dr. Mundy thinks that this recovery plan is a legitimate platform for recovery. I don't think there is any disagreement there.

The fact that no one method is going to recover, I think we are all in agreement on that. He does say back in his conclusions, I think about page 120, that transportation will improve survival or can be expected to improve survival, particularly during low water years.

Ms. FURSE. Thank you—

Ms. UNSOELD. The gentlewoman from Washington. All right, we will go to Mr. Dicks.

Mr. DICKS. Let me ask you this. Ted, you said that certain parts of your plan have not been fully implemented. From a congressional perspective and as someone who is visiting here today but serves on the Appropriations Committee and what I would like to hear is what are the two or three or four things that Congress needs to do in terms of resources to deal with some of the critical problems—I think not funding adequate science is clearly one.

What are the other two or three things that we might be able to do in the near term to help with this implementation of the combined strategy here on the consensus items?

Mr. BOTTIGER. Congressman Dicks, the Congress has done an excellent job of funding and I have to tell you that I am more than pleased with the reaction and the ability to get your ear and other's ears and get budget language in.

We read some budget language in the agricultural appropriations committee that was very satisfying so it is not in Congress. It is in the ability of Bonneville to forecast revenues far enough ahead in order for us to do some long-term budget process and when Bonneville gets in a financial squeeze like any other agency they start pulling down.

And we caught them in a declining revenue situation when we were increasing fish and wildlife budget so if you remember about a year ago there was a little flap and looking back now it was minuscule, it was about \$5 million that Bonneville had cut out of a fish and wildlife budget of about \$80 million.

And there was a big flap about it and candidly Congress told us to back off and that is the approximate amount of money that is not now being funded.

Mr. DICKS. Don, do you have any suggestions?

Mr. BEVAN. Well, Mr. Dicks, I think Congress can certainly have a role in seeing that we start to move ahead expeditiously with recovery. That is not something that Congress writes into law but let me use an example of something I think was very well done by the Power Council back in the 1980's when Senator Evans was chairman of the Power Council.

They put together this idea of a water budget and they put together an excellent plan to evaluate that. This was in the early 1980's. We haven't done that yet. I think that your oversight in what kind of science needs to be done, what needs to be done with regard to a regional getting together on moving ahead; that is a political question, not a scientific question.

I guess I feel as a scientist, what we have tried to do here in the plan is not going to succeed unless there is a political will in the region to accomplish that and you, ladies and gentlemen, have the ability along with the Northwest Power Planning Council, and we think in our plan they have a great place to try to bring this political consensus together.

Let us stop fighting about how best to do it, let us get on with it and try to as carefully as we can, lay out what our differences are and then go find out why we have those differences and that is where science can take a part.

Mr. DICKS. Rollie, if you could just tell me where you think the funding gaps are. I mean you got the ESA responsibility and they are trying to make you guys the salmon czar. We have spent a lot of money on the timber recovery issue but what about the salmon issue and where is the plan, where is the strategy, where is the beef as Walter Mondale used to say? Where is the beef here?

Mr. SCHMITTEN. In this case, where are the fish?

Mr. DICKS. Yes. I am talking about the resources to save the fish.

Mr. SCHMITTEN. Yes. Let me indicate my Agency has really played a catch-up role. Think back only three years ago we were never at the table with the Forest Service, we were never at the table with the Bureau, only until the President brought forward the Forest Plan have we been a full participant and at the table representing fish needs.

And to do that, to play catch-up and to really be an activist in the ESA game, we have had to come forward with Congress' help; we are hiring 29 people. We want to get ahead of ESA, we want

to stop this after-the-fact-type process that we are in and begin to proactively work with the industry and the conservationists to avoid listings.

Where do we think the funding should go? Continued funding for fish and wildlife and ESA needs throughout the Nation but in particular in the Columbia basin, Northwest and in National Marine Fisheries Service, so we can play at that table.

I have indicated the scientific areas, two places that we have to finish so we should do a hatchery study, we have looked at transportation now, we have looked at gas bubble. We are looking at survival flows. I think we should do the hatchery study. Let us make sure we know what we are doing in our hatcheries. And then available water studies. We need to know where is the water before we continue to dictate the terms—basically fish need water and how much there is available we have no idea.

Ms. UNSOELD. The gentlewoman from Washington now.

Ms. CANTWELL. Thank you, Madam Chair. I understand, Mr. Bottiger, they didn't drill you too much while I was gone so I will get back to my original question dealing with the recommendation on the oversight committee and some of those responsibilities.

I see in your testimony here that basically you urged Bonneville to establish a central coordinating form for implementation of an overall strategy and I guess my questions are the same. If we are really talking about teeth which I personally think that we have to have or else you are still in the least common denominator or group rule kind of decisionmaking, if we are really talking about these issues of making certain that relevant permits and biological opinions and conformance with goals and objectives, I mean we are talking about really meeting the agenda, are you saying that the salmon oversight committee recommendations are not workable or are you saying that the central coordinating form for implementing the strategy would do very similar things?

Mr. BOTTIGER. If I can ask you to go with me through the procedure. Are we going to pass a Federal law that says that the agencies and tribes are no longer the manager of this resource, the Federal Government is, and the Federal Government will tell Bonneville when to release water, the Federal Government will decide not to issue any more water withdrawal permits for irrigation. Is this who is in charge of the river because those are the issues.

Now if you are not going to pass the statute, then the only way you can get there is the Endangered Species Act. You need a listed species.

Ms. CANTWELL. I guess the first question is, do you hold that these things have to be done in a decisionmaking process? It could be a succession and obviously we did a bottom-up planning process and not a top-down when it came to State land-use plans.

It is interesting both Oregon and Washington have pursued that. We do not have some case history here and complicated agencies working together on strategic plans so are you saying that you don't think that critical function has to be in a successful salmon recovery process, that kind of decisionmaking, are you saying we can still do it by this consensus process?

Mr. BOTTIGER. Well, first of all, it is not consensus. The Council votes and it takes six votes, six out of eight votes, to adopt a Coun-

cil rule. There are some exceptions to that but generally it is not a consensus process.

Once the Council adopts a plan the current Federal law says the administrator shall use the Bonneville fund to fund the plan. Now that is a political conflict built between the ratepayers and the fish and wildlife interest as to how much Bonneville is going to fund because it is ratepayer money.

That does occur and it is political and Dr. Bevan is right when he says that that is a political process, kind of like Congress or the State legislature. Now the other point, if I can, if you are in a listed species, we have got an endangered species listing, then NMFS through its Section 7 and Section 10 authority has a lot of power.

You cannot take a fish or harass or endanger or anything else without going to Rollie and getting a piece of paper that says you can do it so he has got a lot of power once there is a listing. I am trying to avoid a listing. I am trying to come up with a procedure that never gets there.

Ms. CANTWELL. So what would the central coordinating form for implementation of the overall strategy be charged with?

Mr. BOTTIGER. The Council would adopt the program, the strategy, Bonneville would fund it and when Bonneville funds it, it contracts with others. It contracts with States, with tribes, with the Corps, with the Bureau to perform certain studies. And with Bonneville's financial condition, they are having difficulty doing that without major rate impacts.

Ms. CANTWELL. And this form would be—I mean would that be a group representation similar to who is here today?

Mr. BOTTIGER. I am not following you some place. There is an independent Scientific Review Team to direct the research and this Team would do—both Dr. Bevan's Team and the Council's recommendation would do the same thing and so I point out we agree with them that that needs doing. We need to coordinate this research instead of every agency going off on their own creating all these conflicting results that I talked about.

Ms. CANTWELL. But if we said that that oversight committee was within NMFS and dealt with—just say for discussion sake here—just an advisory role on things like conformance with goals and objectives and ascertain that relevant permits and biological opinions issued by NMFS are consistent with recovery plans, is that something that you would agree to or disagree with or—

Mr. BOTTIGER. NMFS subject to NAFTA can appoint any advisory committee it wants. I don't have any objection or problem with that. I see now you are talking about Dr. Bevan's group. Political pressure, if you pick the right people who use the press and other ways to put political pressure on NMFS making the right decision, is an effective way to do things so we have all done that before.

Mr. BEVAN. Ms. Cantwell, if I may add, the Team is charged under the Endangered Species Act with putting together a salmon recovery plan. The Team feels very strongly that the Endangered Species Act gets in too late and gets out too early. Simply delisting a species that is now capable of maintaining itself without providing harvest, both sport and commercial, is not a satisfactory solution.

We believe that that abrogates our treaties with the tribes, that we are trying to produce fish for commercial use here over and above what we are doing with ESA. Let me give an example of where we think the system breaks down and you need to have some independent group.

About a month or two ago the Northwest Power Planning Council gathered all the various agencies' scientists together to discuss flow and survival, a critical issue with a great deal of uncertainty and a great deal of controversy.

Those people arrived in the room, some of them refused to show the data that they had on the subject, some of them would not even discuss the issue at the meeting.

We simply have to stop things of that kind and be able to have someone else take a look independently and say, all right, you have done your best to put things together, we respect that, but if you failed, we have to move ahead.

We can't use the failure of reaching a consensus as an agreement that we are going to stalemate and not move ahead.

Ms. CANTWELL. Thank you. Believe it or not—but you would say that process has teeth moving ahead somehow after you had all the discussion and then moving ahead. You have to have a process of deciding then that you are moving ahead.

Mr. BEVAN. I think that is absolutely correct. And I see much in the present system of not being able to reach that kind of conclusion.

Ms. CANTWELL. My time is expired, Madam Chair, but if you would like the other panelists—

Ms. UNSOELD. I think Mr. Holt seemed to be indicating he wanted to comment on that.

Mr. HOLT. Just one fact, Madam Chair, and it is true, we believe that NMFS needs to take an active role in areas such as habitat and others. Our fear is of course that when BPA approaches the particular science in the new arena of biology that we will begin to again duplicate and replicate the past of studying the creature to death.

And that is a strong contention that the tribes have and we believe the Pacific salmon treaties, chinook rebuilding program, the Columbia River Fish Management Plan, have adequate and strong direction and recommendation that should be considered.

And certainly when we think of endangered species and the ESA itself, the teeth of that particular act need to be revisited by Congress. We find it rather ironic when the tribes under the new Recovery Team's plan focuses on tribal harvest as elimination of usual and accustomed fishing sites.

When the hydro system is given a no jeopardy, we find that this is rather confusing and amazing that such fine minds throughout the Nation would provide for a direction without actually researching and revisiting some of the past actions and document science and biology that exists. Thank you.

Ms. CANTWELL. Thank you. If I could just add, Madam Chair, I don't want to underemphasize how much I realize that the Northwest Power Planning Council and the Recovery Team and the Inter-Tribal Commission have done so far on this issue. Work has been tremendous. We appreciate you getting us this far. We will

look forward to your leadership in helping to resolve, to the best of our abilities, a very intense crisis for us in the Northwest.

Ms. UNSOELD. Let me get a sense of my Committee. Elizabeth, do you have additional questions that you are going to want to ask? Maria, do you have others? Then I know there will be some written ones but there are a couple of things that I would like to pursue with the panel. No, you are not quite through.

I would like to ask Rollie about how you incorporate, how you really incorporate the peer review results into your final product and does the Federal Advisory Committee Act get in the way? Let me pose that to you and then I will pick up the other issue I wanted to address.

Mr. SCHMITTEN. We certainly will incorporate peer review information, and on these scientific areas of uncertainty we have asked for that. Specifically, we have financed the peer review of the transportation. We have called for the peer review of gas bubble. I would like to see a similar thing done with hatcheries and—yes—they will be a part.

The beauty of what you might call a living recovery plan is that you gain more science. It is flexible enough to allow change. For any of us to think that what either the plan puts out or even what the Fisheries Service puts out is the end of this is certainly a misconception because there will be changes.

The Federal Advisory Committee Act, I really need to respond legally to you. I am told that it is a hindrance in getting full advice. Normally that is why we work through FOEC—the Fish Operations Executive Committee—to the Power Council but as far as direct advice or forming advisory bodies we are prohibited through FACA.

Ms. UNSOELD. I would appreciate additional response on that from the agency because I think it is something that we need to address to permit you to do the job the way I believe that Congress anticipated that it really should be and we don't want one reform to get in the way of the other.

The additional area that I would like this panel to explore and we have touched on it but in my view it is so necessary to look at the big picture in how we address this issue and I started with Ted to ask about whether the Endangered Species Act is a help or a hindrance in trying to get there, does it narrow the focus too much?

The Endangered Species Act is a wonderful club but I liked what you said, Don, that it comes in too late and goes out too early. It should be a last resort that we should not have to bring in to play.

Once it has, is it going to prevent us looking at the whole ecosystem approach to this issue? Any of you might want to answer that. The other thing that I would like you all to address is, what do you believe the future role of hatcheries in the overall picture of perhaps quantity, if not quality, is going to be?

Mr. BOTTIGER. Do you want me to start?

Ms. UNSOELD. Sure.

Mr. BOTTIGER. If your first half of that question was what amendments to the Endangered Species Act—

Ms. UNSOELD. Not that specific—I was not going to put you on the spot.

Mr. BOTTIGER. Single species problem, what do you do when what you do for one animal hurts another? And we have a lot of that in the region. The other problem we have is, how long does it take a hatchery-induced run to become a natural run or a wild run, if ever?

Because as we change the river, we have changed the fisheries' makeup, and so we can have harm to a thriving fishery but it may not be protectable because it is not "wild."

The other half of your question—I am sorry, you are going to have to help me—oh, the hatcheries.

Ms. UNSOELD. The hatcheries.

Mr. BOTTIGER. We would very much like to get started on supplementation. As these runs drop there is going to be a time when you either declare them extinct or you intervene. With the sockeye we waited till we got down to eight fish.

We are now down in the 600 figure in spring chinook. At some point we start intervening or just let them go and the Nez Perce has a supplementation proposal for the upper Snake River that we think ought to be approved but it is an endangered species and Rollie is going to have to get us a second permit.

Other than that, hatcheries have been kind of a sop for the squeaking wheel. If somebody complained enough you gave them a hatchery. We probably got too many. We may have a river that doesn't have the capacity to take 25 million juvenile fish all at once. We may not have the food supply.

Ms. UNSOELD. Would someone else like to—yes, Mr. Holt.

Mr. HOLT. Thank you, Madam Chair. Regarding the ESA, we believe that currently the ESA is somewhat the law of the land. In many ways the tribes have been friendly to the ESA. Of course, harvest has been an issue that has been put upon the tribes under that act and we felt that, of course, as Madam Chair had mentioned ecosystem management in its approach, the concept itself is of origin in the sense of the tribes have always been ecosystem managers.

However, we feel that the approach that NMFS and others use in regards to managing the stocks should be that all stocks are managed equally and not just those that are threatened or potentially listed, and I think that complements and supports the ecosystem approach of the current Administration.

And as far as the future role of hatcheries, we feel that there is some substance there. Of course, our frustration is in areas such as the Mitchell Act where those particular initiatives in the proposal were to be putting fish back into the tributaries.

Unfortunately, those fish now only return up to the Bonneville dams on the Columbia and do not reach the tributaries. Mr. Bottiger mentioned also the Nez Perce program for supplementation. I would like to cite those words and statements today back home because unfortunately we don't get the support for that program.

We are being met with political and scientific rhetoric at times in our minds where we feel that a concept of gravel to gravel management of putting the fish back into the habitat of their origin is the correct place.

Certainly we can rear them at the hatchery to an age that is providing protection in the future, but we need to bring them back to the tributaries and I think that provides for the Forest Service and other Bureau of Land Management agencies to do a part in the ecosystem approach of managing the habitat for the future. Thank you.

Ms. UNSOELD. I should have perhaps clarified or tried to summarize, Ted. Would you say that the role of hatcheries needs to be reinvented? We have very little data on—

Mr. BOTTIGER. We don't know why one hatchery gets a lot better return. Is it the manager, is it the water supply? There is a lot of science shortage in this area and reinvented, I am not quite sure. You got supplementation—

Ms. UNSOELD. We got to learn something about how they have functioned or not functioned and what we do to make our money.

Mr. BOTTIGER. I am going to formulate a theory called density. At some point you can't crowd any more people in the elevator or they die and it must apply to fish too.

Mr. BEVAN. I certainly think they have a place, Madam Chairman. The difficulty that I think we have is that we have got over 100 hatcheries on the Columbia River. You would think that there would be some overall plan in what they should be doing. We don't have that plan.

We do have some technical teams at work to look at some very important factors, disease, genetics, etc., and I think that phase of it is in pretty good hands but, again, hatcheries are run by public utility districts, States, tribes, different Federal agencies and part of the problem is no overall planning.

Ms. UNSOELD. Rollie, I don't know what the correct term is in this context. On a ski slope it would be coming down sweep but it is your opportunity.

Mr. SCHMITTEN. It is a fast ski patrol and I understand that. Just a passing note on the ESA. Frankly, let us not forget that it is the single most significant piece of legislation for species survival in the world and it is heralded as such throughout the world.

I don't necessarily think that it is the Act that is wrong, often it is the focus of the Act. It is the failure of agencies such as mine not to respond or responding too late and not responding before a listing, and I do agree, as I have said to the Chair many, many times, that it is much superior to look at an ecosystem approach.

As far as hatcheries go, hatcheries have proven to be a part of the problem in the Columbia River. It doesn't necessarily mean that we should do away with hatcheries, it means that we should put out smart hatcheries. We should look at densities, we should look at disease, we should look at release time, we should look at necessary stocks.

Oregon Trout made it very clear to us when they proposed for listing the lower Columbia River coho that we had eradicated them as a population by planting 36 other types of coho in a single system; so we do need to have smart hatcheries.

The final point is that we support the supplementation concept and I think this is important because we have not always enunciated that clearly to the tribes and others; and the we is both the

Fish and Wildlife Service and the National Marine Fisheries Service.

We should be using that tool more readily. The only caution is that we should be careful not to exacerbate the condition of a listed species. Let us first make sure they are ESA-free areas, and then we should go in and support each other in getting them started. Thank you.

Mr. BEVAN. Just a comment, Madam Chairman, on your question about the ecosystem approach. Is this recovery plan by itself an ecosystem approach? Probably only for the ecosystem of the Snake River-listed species but we see it as a template to provide for the rest of the basin and what we have provided here as required by law under the Endangered Species Act we think can be applied to other stocks in other parts of the Columbia basin.

Ms. UNSOELD. I would only suggest that the ecosystem probably extends to Alaska. Any last comment?

Mr. BEVAN. And certainly to Canada.

Ms. UNSOELD. Certainly. I thank the panel very much. There are some additional questions that will be submitted to you in writing and if you get any burning comments that you want to make to us, we are eager. Thank you very much. And if the second panel would come forward.

Ms. CANTWELL. If the people would take their seats we are going to start with the second panel and I appreciate all of you being here today for the continued discussion on the Subcommittee on Environment and Natural Resources Hearing on Proposed Recovery Plan for Endangered Salmon in the Columbia River.

And we will start with Mr. Bruce Lovelin, executive director for the Columbia River Alliance.

STATEMENT OF BRUCE LOVELIN, EXECUTIVE DIRECTOR, COLUMBIA RIVER ALLIANCE

Mr. LOVELIN. Madam Chair, members of the House Committee of Merchant Marine and Fisheries, thank you for the opportunity to testify. My name is Bruce Lovelin and I am the executive director of the Columbia River Alliance for Fish, Commerce and Communities.

Our organization represents a diverse group of entities throughout the Pacific Northwest and we believe in maintaining a strong multi-use river system for the economic health of our region.

We further support efforts to save threatened and endangered salmon runs. I think as the region pursues salmon enhancement we must realize that deterioration of the Columbia River Basin salmon runs occurred over more than a century and that no single cause is responsible.

Restoration of the run will at least require several decades involving all aspects of the salmon's life cycle and will require a major commitment of all Northwest parties. In this year, 1994, citizens and businesses from the Pacific Northwest will pay almost \$350 million for salmon enhancement through higher electric power rates.

This is almost double the funding of two years ago and it may increase in future years. Columbia River Alliance members are concerned with our continued ability to fund these programs. The busi-

nesses, communities and the public that we represent are frustrated that although over \$1.5 billion has been spent in the last 13 years, the salmon runs continue to decline.

We believe that future funding is uncertain and we are pleased with the Administration's recent acknowledgement of this fact and the announcement to use taxpayer funding for spill and flow programs of between \$10 and \$30 million.

The Snake River Salmon Recovery Team's plan, in general, we believe has three elements that make it the best blueprint for salmon recovery. The plan is scientifically founded, it is comprehensive covering each stage of the salmon's life cycle and it was created through an open regional process allowing technical peer review and comments.

The plan does include reform of hatchery practices, it does include reforms of harvest practices, it does include habitat enhancement. It does recommend improvements in the mainstem including an immediate action the region should rely upon.

The barging or transportation system barges juvenile salmon around the dams and releases them closer to the ocean. The plan also includes flow levels as prescribed by the Northwest Power Planning Council but it also recognizes that additional research is necessary to determine future river operations.

But the plan cautioned against controversial reservoir drawdowns. A John Day reservoir drawdown was considered and rejected by the Team. Other drawdown options were not seriously considered as effective.

In addition to the plan's specific recommendation, it provides a framework or process for which future decisions can be made on a timely basis using the best available science. It will lead to better coordinated management of the Columbia River Fishery Management System and we believe that this measure is desperately needed.

But will the Bevan Plan or this recovery plan lead to recovery? I think we need to understand that we have got major natural events occurring at this time which are pushing the runs down further. This year, which has been commonplace in the last several years, Snake River flows are below average with only about 50 percent flow this year as we again experience a drought.

Also, poor ocean conditions are causing lower survival for both these threatened salmon and other runs up and down the Oregon and Washington coast. But despite these natural events the CRA believes that we still should pursue salmon recovery via the Bevan Plan.

As the Bevan Team acknowledges, much is still unknown regarding salmon and additional research is necessary. Implementation will likely require adaptive management allowing for mid-course corrections.

The Recovery Team anticipated this action in its plan. As an example, our members believe that the Team was incorrect by recommending habitat protection standards developed by PACFISH or FEMAT. We believe a more cost-effective approach for stream restoration and protection, one supported by user groups, like the new Oregon Forest Practices Act is an example. We will pursue this approach in what the plan calls its habitat subcommittee.

Economics is an important element in the plan. What does the plan cost? Can the region afford it? And as of this date, these questions cannot be answered because both the costs and the benefits of the plan have not been provided.

We have advocated a cost-effectiveness analysis be performed on the plan. This information is required as it will allow the region to pursue the highest value salmon recovery measures first.

A critical next step to this plan, and we believe it is required for successful implementation, is regional acceptability and support. This support is required by the Administration, States, tribal entities, regional communities, economic and fish advocate groups.

The plan's success is predicated by stakeholder involvement and participation. The exclusion of economic stakeholders in January, 1994 by the Administration during the Endangered Species Act, Section 7 consultations on flow operations led several of our CRA members to seek participation using the courts.

If we are to avoid a regional spotted owl train wreck then the Administration must open the process and it must be opened in a meaningful manner. An open process encouraging stakeholder participation would have provided additional scientific information on the recent Federal agency decision to spill water at eight Columbia and Snake River dams—a program which we believe, at best, spent \$11 million of taxpayer funds, and at worst may have harmed the very fish that we are trying to help.

The CRA supports efforts in the Bevan Plan and we request that the region move forward to proceed rapidly with the plan because without it, decisions such as the recent spill program and possible dictates by the Federal court could become commonplace.

A comprehensive plan that is scientifically based is needed and we do support that. Thank you for the opportunity to testify.

[Statement of Bruce Lovelin can be found at the end of the hearing.]

Ms. CANTWELL. I should have added at the beginning that everybody's written testimony will be incorporated into the record. Ms. Bodi.

STATEMENT OF LORRAINE BODI CO-DIRECTOR, AMERICAN RIVERS

Ms. BODI. Thank you, Madam Chair, and members of the Committee. I am here today representing American Rivers, which is a national river conservation group, and Save Our Wild Salmon, a coalition of 42 conservation and fishing groups working on salmon recovery throughout the Pacific Northwest, not just in the Columbia River.

I would like to talk about salmon recovery in the Columbia today and my message to you is one of urgency. Like many of the speakers on the previous panel, I believe we are running out of time to take action and we need to bite the bullet now.

The first point that I would like to make is that a recovery plan for the salmon is long overdue. I think it is very important to look back on where we were about 15 years ago right before the Northwest Power Act was enacted.

I was around then and so were a good number of my panelists, in fact, maybe all of them were around working on these very same

issues. And what did we have going on in the region at that time? We had an Endangered Species Act review being undertaken by the National Marine Fisheries Service that had commenced in 1978 for upriver stocks in the Columbia and the Snake, both the upper river areas.

We had unprecedented restrictions of fisheries far tighter than we had ever seen before. We had agency and tribal recommendations for flow improvements and fish passage improvements that were on the table and not being implemented.

And we had the dam operators calling for continued barging of the salmon and more studies because we didn't have enough information to move forward. That is where we were right before the Northwest Power Act was passed. That was supposed to be our saving grace.

It was supposed to provide our recovery plan and move us forward to break the gridlock and get us on with action and not just debate. But it didn't work out, despite good intentions, the way we had anticipated.

We didn't implement the agencies' and tribes' recommendations. For the last 15 years we have basically barged and studied. Now we have fish listed under the Endangered Species Act. They are at the lowest population levels ever.

Fisheries have been closed up and down the coast and we are still debating what to do about it. To me that is a very sad state of affairs for both the fisheries, our fishing communities and the region.

My second point then flows from the first one. We need a recovery plan that is finally an action plan. It has to be specific. It has to be a cookbook. It has to have specific steps, performance standards and time tables—not be inflexible but move us forward in very specific ways and break the gridlock.

Now the Recovery Team recommendations are good as far as they go. They are a framework. They have the elements that we need, the table of contents of a recovery plan, if you will. But let me just give you an example of how we have a gap between the goals of the recovery plan and the steps that we need to get there.

The Recovery Team calls for two spawners for each one in the previous generation, at least for the foreseeable future. That is a two-to-one replacement rate and as you know we are not even at a one-to-one replacement rate now. The Recovery Team also identifies the need for about a fourfold increase in survival of these fish through the migration corridor.

Yet there is no step-by-step approach to get us to these measures showing that within two generations, three generations, four generations, we will get to that point of rebuilding and recovery. That is something that the National Marine Fisheries Service is going to have to address.

While there is a lot of talk about addressing all aspects of the salmon life cycle, there is an inescapable fact that we have to deal with in this plan: 80 to 90 percent of the human-caused mortality to the fish is caused by the dams. There is no question we must fix the problems at the dams if we are going to recover these salmon. The Power Council's plan admits this. The Recovery Team has

provisions scattered throughout that recognize this. It is a fundamental fact that isn't going to go away.

Now I would like to address the claim that we don't have enough science to support moving forward and to support specific actions such as flow augmentation, flow targets, reservoir drawdown.

As someone who has worked on these issues for a number of years, I think this claim is misleading at best. We have volumes and libraries of studies monitoring information, information on the biological needs of the fish, and there are two inescapable conclusions that underlie all of this.

First, the fish need better, faster flows for recovery, and, second, while barging may be an emergency measure, it has not and will not lead to full recovery of these fish. So we need to get on with action that moves us past the barging, past the interim measures.

Like the tobacco industry claiming there is no scientific proof of the link between smoking and lung cancer, I am concerned that dam operators are claiming that we have insufficient proof that fish need flows.

By their measure I am afraid we will have proof that fish are extinct before we have proof that they need flows. As Mr. Holt indicated, we are quite literally studying the fish to death.

My third point today is that, and it seems obvious, but a recovery plan has to be implemented in full. It cannot be a cafeteria menu where we do the easy stuff and skip the hard stuff. Yet if the past is any indication we have cause for grave concern.

The water budget first developed by the Power Council in 1982 was not fully implemented until 1990, after we had petitions to list Snake River salmon. Even today, John Day drawdown and Lower Granite Dam modifications to study drawdown—which have been endorsed by the Power Council, the three governors and the National Marine Fisheries Service—have difficulty getting appropriations.

And if you look at the time tables for implementation and evaluation that the Corps of Engineers is proposing, we have an evaluation that is going to extend over a decade or more. If we are serious, we have to focus on fast and complete implementation. The fish simply don't have a decade or more to spare.

Finally, I would like to make a comment about the fact that when I sat back and looked at my main comments I thought, well, these are obvious points. We need action, we need implementation, which seem fairly obvious. But so far the Northwest has been unable to move forward with a real action plan.

We have lacked the political will to move forward. Perhaps it is a leadership issue, perhaps it is a question of who is in charge, but it hasn't worked so far. In the next few years our legacy to our future generations lies in the balance.

We do not have another two decades or 15 years to try to get it right. We are either going to be known as the generation that saved the salmon or the generation that let them go extinct on our watch.

If we develop a good and true and detailed recovery plan now, it is not too late and we can still choose the legacy of the salmon. I hope we do. Thank you very much.

[Statement of F. Lorraine Bodi can be found at the end of the hearing.]

Ms. UNSOELD. Thank you. Mr. Tienson.

STATEMENT OF THANE TIENSON, COUNSEL, SALMON FOR ALL

Mr. TIENSON. Thank you. I am Thane Tienson. I am here today on behalf of the commercial salmon fishing industry. I am somebody who grew up in the industry and I am from Astoria, Oregon, which is in Congresswoman Furse's district and right across the river from Congresswoman Unsoeld's district, and as both of you know the industry is centered in those districts so we have an enormous concern with the shape of the Salmon Recovery Plan.

We are very concerned, not only about the specifics of the plan itself, but the principles that will guide the adoption of a plan because we assume that whatever those principles are that they will guide not only this plan but others as well and they will have ramifications extending well beyond salmon and well beyond the Columbia River Basin.

I am particularly concerned and I know I speak for the commercial salmon fishing industry about the harvest sections of that plan because I think the harvest sections as well as those sections dealing with the institutional changes and with downstream migration really collectively make us extremely uncomfortable with the plan and in our view the principles that should guide a recovery plan simply aren't manifested in this plan.

I am assuming that those principles include the following. One, you want an objective plan, a plan that is long on science, short on politics. You want a plan that enjoys the support of Federal, State, tribal fish managers and scientists, a plan that will survive judicial scrutiny but also a plan that will discourage further court challenges, the agency decisionmaking.

You want a plan that is balanced and proportional but is proportional in the sense that although shared sacrifices are certainly called for, its primary emphasis must be on those actions and practices that have brought the salmon to their precipitous decline.

And above all you want a plan that works, a plan that if implemented will not only restore the listed stocks to be taken off the ESA list but one that will restore all stocks in the region to harvestable levels of abundance that we can preserve our commercial, tribal and sport fishing industries and protect our obligations to the treaty tribes.

If that is the test, and I submit that it should be, then I must tell you that particularly with respect to those sections of the plan I just talked about, this plan not only fails, it fails miserably.

It is a plan that because of its insistence on the need for yet more studies and a continued reliance on barging these juvenile salmon to sea, I submit is more of a blueprint for extinction than it is for recovery and survival of these stocks.

The harvest section, as you know, calls for mandatory elimination of the gill net fishery over the next eight years and a 20 percent reduction in the ocean commercial salmon fishery over the next eight years which in my mind translates effectively to its elimination as well.

So, in effect, a solution to the salmon recovery program is to eliminate the need for recovering the salmon, eliminate the need to recover these stocks to the levels of harvestable abundance.

Both Dr. Bevan and Mr. Bottiger and Mr. Schmitten all testified about the need for having a plan that didn't single out any particular user group. In fact, I wrote down Rollie Schmitten's words, "no single user should carry the burden of recovery".

Congressman Crapo talked about a plan that we wanted to ensure did not devastate any particular group of people or industry. Well, let me tell you, under either of those standards this harvest section does exactly that. It devastates an already devastated industry and it insists that the lion's share, the burden of recovery, rests with the commercial salmon fishing industry.

This, I remind you, is an industry that this year has experienced over 95 percent reduction in harvest over the levels of only four years ago. We have essentially consigned our coastal and river communities that only a decade ago were salmon dependent to a reliance on tourism and elimination of an incredibly important industry that has contributed so significantly to those economies for well over 100 years.

It isn't fair. Both Dr. Bevan and Mr. Bottiger talked about the differences between the Council's plan and the Bevan plan and they said really the only differences were in the science. There are not differences in the science, there certainly are not differences in science with respect to the harvest section. Is the voluntary buyout and leaseback program advocated by the Council and the mandatory elimination advocated by the Bevan Team a difference of science? No. It is a difference of politics. We know that.

We know that because we are an industry that has been so devastated we are politically impotent. We know that we don't have the political power that can force Congress or the agency decisionmakers to do our bidding for you so we rely upon our elected representatives to influence those decisionmakers and that is why we are also uncomfortable with the notion that we should place primary responsibility for salmon management in the Northwest with the National Marine Fisheries Service.

It is an agency that has not demonstrated that it deserves the confidence of Federal, State, regional fish managers. It is certainly not an agency that has demonstrated it deserves the confidence of the commercial fishing industry.

Rather it is, as Judge Marsh recognized it is, he invalidated the 1993 Biological Opinion on river operations, it is an agency that really has done its utmost to maintain the status quo taking very small steps, minor improvements and adjustments, and these are his words, narrowly focused on what the establishment is capable of handling with minimal disruption when the situation literally cries out for a major overhaul.

And I submit to you that the National Marine Fisheries Service, even if it had the political will which it clearly does not, it doesn't have the resources or the institutional ability to manage the salmon and take care of its other statutory responsibilities as well.

And unless and until the agency, unless and until any agency or group of agencies has those resources, has the political will and en-

joys the confidence of those people it regulates, it should not be placed in that responsibility.

So we urge you to use your influence with the agencies to make sure that whatever salmon plan is adopted is one that addresses the needs and principles that we think should guide it and make sure that we restore these fisheries to levels of harvestable abundance and protect our commercial, tribal and sport salmon fishing industries. Thank you.

[Statement of Thane Tienson can be found at the end of the hearing.]

Ms. UNSOELD. Thank you. Next Mr. Bakke from Oregon Trout.

STATEMENT OF BILL BAKKE, DIRECTOR FOR RESOURCE CONSERVATION, OREGON TROUT

Mr. BAKKE. Thank you. My name is Bill Bakke, representing Oregon Trout. I would like to lead off by saying that Oregon Trout is the lead petitioner on the Snake River chinook that were listed under the Endangered Species Act and frankly right now I think we are at the point where those chinook should be upgraded to endangered status.

The problems confronting the salmon in the Columbia River are not unique to the Columbia River, they are coastwise problems but the Recovery Team is focusing on the Columbia River. I am hoping that it will serve as a model to address problems from central California actually all the way to the Canadian border.

Let us deal first with the questions. While Oregon Trout made many critical comments on the draft recovery plan, we concluded that it was the first full life cycle plan the region has ever produced and therefore we generally supported it.

The only other life cycle plan is the strategy for salmon recently adopted by the Power Planning Council but the Council lacks authority to implement its plan. The strengths of the recovery plan are it provides a single authority and accountability in the National Marine Fisheries Service, it establishes a Scientific Oversight Committee so the recovery measures are scientifically driven and evaluated, and it sets a sound delisting criteria.

And without a recovery plan, the region will continue to perpetuate the problems that cause the salmon to be listed in the first place. The weaknesses of the recovery plan are its reliance upon technological intervention such as hatchery propagation and smolt transportation. Based on our review of scientific literature, we view hatchery supplementation as an untested theoretical experiment that should not be broadly applied until evaluated and any funding directed toward supplementation should be looking at risk containment.

Another major weakness is that the recovery plan does not establish an institutional mechanism or commitment that is specific to the recovery of natural stocks which I thought the recovery plan was supposed to be doing. This is evident from the absence of a natural production strategy stated specifically within the plan.

Finally, the National Marine Fisheries Service cannot by itself recover salmon without the institutional commitment of other Federal and State agencies to solve the salmon habitat problems in the region.

Will the recovery plan lead to recovery of the stocks? The recovery plan is experimental and must be treated as a scientific experiment and it is therefore very uncertain, especially when you add the politics to the equation.

The other existing proposals that would increase the likelihood of recovery are PACFISH and FEMAT, the President's plan for western spotted owl forests. They establish habitat conditions that would maintain the productive capacity of salmonids on Federal lands.

And we need to expand those efforts, those proposals, to non-federal lands so that we can actually do watershed analysis and planning and recovery.

Also, the States of Oregon and Washington are looking at developing policy. Oregon's wild fish policy and Washington's wild salmon policy, these policies could help to recover a multitude of populations that are already in the ESA pipeline. The Power Council's strategy for salmon should be incorporated into the recovery plan especially Section 6.2(a) which deals with the recovery of natural salmon populations.

Other actions that could be taken are the following: develop a national policy for the conservation of native fish fauna diversity; cause each hatchery operation that is operating with Federal funds to comply with the National Environmental Policy Act. All hatcheries should be licensed so that periodic public review is provided.

Reauthorization of the Magnuson Fishery Conservation Act to specifically address meeting standards to provide spawner escapement to maintain the productive capacity of each of the salmon stocks. Restructure hydro dam mitigation to fund biological inventory and habitat protection rather than replace wild salmon with hatchery salmon.

Discontinue transportation of juvenile salmon by truck since the fish that are transported in this way are unable to imprint effectively. They become lost and stray into other watersheds, they spread disease and they disrupt the local gene pool.

What should be the essential elements of the final recovery plan? First, the plan should be driven by science and scientific evaluation. The Scientific Oversight Committee would establish this.

Second, a priority must be placed on completing an inventory of the natural biological diversity of salmonids on the entire west coast. This data can then be used to evaluate the various management and recovery experiments being conducted.

This would allow the agencies to conduct adaptive management and even describe success. And we are also recommending the use of a portion of the Mitchell Act hatchery funds that are presently before Congress to provide some dollars to complete that inventory for at least the Columbia River Basin.

But the recovery plan, however, lacks these essential elements. In conclusion, the region lacks a coherent health plan for native salmonids, a health plan that is imbedded institutionally both among and within Federal and State land, water and fish management agencies.

This plan should be based upon maintaining the genetic and life history needs of the native stocks in the Columbia River Basin as well as along the whole west coast. Thank you.

[Statement of Bill Bakke can be found at the end of the hearing.]
Ms. UNSOELD. Thank you. Mr. Wright.

STATEMENT OF AL WRIGHT, EXECUTIVE DIRECTOR, PACIFIC NORTHWEST UTILITIES CONFERENCE COMMITTEE

Mr. WRIGHT. Thank you. My name is Al Wright. I am executive director of the Pacific Northwest Utilities Conference Committee, a trade association representing both private and public utilities in the four northwest States as well as the direct service industries in those same four States.

We are here today to add support for both of the two legitimate plans that can lead to the recovery of anadromous fish that are on the table today, as you have already heard, the Council's strategy for salmon and now the Recovery Team's proposed Snake River Recovery Plan.

We had supported the work of the Recovery Team before we ever saw a draft. We told the National Marine Fisheries Service that if they would appoint credible scientists that were objective, we would be willing to support a plan that came out of that and give it a chance to work and our position remains the same.

We believe the recovery plan is comprehensive. We believe it does deal with all four facets of the gravel to gravel life cycle of the animal. We believe that given the Council is entering into rulemaking this summer and fall and given that the National Marine Fisheries Service is doing a similar type of rulemaking this summer and fall for adoption of these two plans, there is both an opportunity for success in marrying up two plans which have far more similarities than differences; have a single recovery plan that can be put in place which we desperately need in the region.

We also have a formula for disaster if we turned it into a warning plan process throughout the summer and fall and allow the issue to be taken solely to the courts. We believe that while we have to move forward in a prudent but rapid fashion that we also need some patience in this process.

We need to get a scientifically based recovery plan in place, implement it and let it work. In the decade of the 1980's we were changing the Council's fish and wildlife program every two years and in the decade of the 1990's we changed what the silver bullet is for fish every two weeks.

We cannot implement a salmon recovery plan in that manner so our support, not only because we believe the plans are scientifically based, our support is because we desperately in the region need some kind of long-term salmon recovery guidance.

One thing the plan does not do is, it does not evaluate the economics involved. We presently have \$1.5 billion as you have heard already. We are spending \$1 million a day on salmon recovery. Why would any industry support additional plans when they are spending that level of money on recovery?

It is simply because as I have already stated, we desperately need some kind of long-term guidance, not panic and hysteria. But one thing that does need to be done is we need to look at the existing \$350 to \$360 million a year expenditure and reprogram some of that money better directed and better implemented into the recovery plans that we hope will be adopted this year.

One thing that can be done today and should be done today and you have already discussed in the previous panel is the Recovery Team's recommendation for some form of scientific oversight committee.

We think that is a good idea. We think we have seen in the gas bubble disease debate in the last few weeks an example of how that can work and work well. And we strongly support and hope that there is some activist who will see that the Recovery Team's recommendation is implemented on some kind of scientific oversight basis.

In summary, we are as an industry committed to getting a recovery plan hopefully by the end of the year. We hope it has not only timely actions in it but it also has the ability to have the patience to allow a recovery plan to work.

We strongly support the monitoring and evaluation because there are parts of the plan we think go too far but we have faith that if we do good monitoring and evaluation that will be proven out over time and we must not allow the region to step in to the warring plan game over the summer and fall of what I think we have the potential of getting into.

We must marry up these plans. We must have a single recovery plan and we must get on with it. Thank you.

[Statement of Al Wright can be found at the end of the hearing.]
Ms. UNSOELD. Thank you. Ms. Hamilton.

STATEMENT OF LIZ HAMILTON, EXECUTIVE DIRECTOR, NORTHWEST SPORTFISHING INDUSTRY ASSOCIATION

Ms. HAMILTON. Thank you and good afternoon, Madam Chairman, and members of the Subcommittee. I first wanted to thank you for the opportunity to be here and testify today. I am Liz Hamilton and I serve as the executive director for the Northwest Sport Fishing Industry Association.

We are a trade group. We represent hundreds of businesses and thousands of jobs in the Pacific Northwest. From worms to downriggers and from major retailers such as Fred Myers and GI Joe's and Buy Mart to the little ma-and-pas on the corner, the men and the women and the businesses that we work with are dependent on and dedicated to healthy salmon resources.

In the States of Oregon and Washington alone our industry generates \$3 billion annually toward the health of our State economies. Those are renewable, healthy clean dollars. The sport fishing businesses I represent are as diverse and geographically dispersed as the salmon that we rely upon.

We organized to be a united and positive force for the salmon recovery that our businesses require for a healthy future. And just by way of introduction, in my written testimony I have included a listing of our businesses so you can become better acquainted with us.

In reviewing the recovery recommendations, I have to apologize, I just received the final copy Friday from NMFS but the thing that became immediately clear as I read through it is that the lower Columbia commercial fishing interests have been determined to be expendable.

The decline of stock abundances and a lack of serious changes in the management of the hydro system sends a clear message to the sport fishing industry as well that we may be expendable. With the tribes substantially excluded from harvest this year as well, it seems like the harvesters have been written out of the equation completely.

The Team's plan does a great job of describing the detrimental effects that the building and operation of the hydro system has had on our fish populations. It is really one of the best descriptions I have ever read.

So, in reading that, I was expecting them to go on and describe how alterations in the Columbia River Basin—primarily the construction and operation of dams—are the cause of the problem, and in order to create a solution we need to move on to some changes.

But having identified the dams as the overriding problem that doesn't seem to be the case. There is a lack of recommendations for modifications but a lot of suggestions for more studies.

And we are a bit sensitive in the sport fishing industry because our backs are up against the wall as well and so when we hear study it is just like studying the fish to death and we are following the fish behind.

Instead, they seem to focus on secondary mortality such as problems with habitat and problems with hatcheries and harvest, especially harvest. It seems to feel it can grab that immediate handle and with the year in and year out reductions in harvest that the fishing industry has had to put up with, we feel like we have anteed up in this game already.

We have already ponied in to the point where we hope these sacrifices that we have made to date are not meaningless. As an industry association we are also concerned about the continuation of the bargeing program. For 18 years more and more juvenile fish have been barged and less and less adults have returned.

It just seems to really have been an excuse to avoid making the necessary hard choices that we need for the fish. The other concern is back to the studies. We don't want a continuation of studies without action. I mean studies are valuable but studies as Lorrie stated earlier, the only thing we are going to be certain of eventually is extinction if we continue on that path.

While we might be compelled to gather more and more information about this without action this information is of no benefit to the fish stocks. There has been some cost or talk about cost for the recovery of the salmon and I think one of the things we need to look at when we are putting these dollars into recovery is the idea of sustainable harvest of these populations for two reasons.

It is of a benefit to the fish to have the larger populations for withstanding natural disasters such as El Nino or Mt. St. Helens, or drought, whatever, but it is also of benefit to humans in terms of an investment in our region and to get a return on that investment we have to go back to harvestable numbers of fish.

Our industries generate a great deal of money to the States that we operate in and our region does not get a return on the investment of recovery unless the industries are strong. Our Northwest has been described as any place that a salmon could get to and I

would hate to see us redefine ourselves as the place that salmon used to be.

It is not necessary and it is unacceptable. We do have the building blocks for the salmon recovery. What has been lacking is the political will to make these hard choices. The Northwest needs more leaders such as Judge Malcolm Marsh.

We need to stop the blame game and we need to work together on the difficult solutions which the entire society is going to have to participate in. The Northwest Power Planning Council has provided an adequate starting point in its strategy for salmon. With modifications and recommendations from tribal and State agencies, we feel we can still avoid the all too familiar train wreck. Thank you.

[Statement of Liz Hamilton can be found at the end of the hearing.]

Ms. UNSOELD. Let me throw a question out for all of you because I have heard the theme repeated that we don't need a lot more studies, we need to get on with the action. But the Northwest Power Council can make recommendations but does not really have the authority to make the decisions and implement them. The National Marine Fisheries Service doesn't kick in at all until the Endangered Species Act steps in so what would you as a panel of experts with a lot of experience in this area, what would you recommend to make this a more efficient decisionmaking and implementing process, what should—you look ready to answer that. I would like to hear from all of you but you first.

Ms. BODI. I would like to first point out that in many ways, if you are talking about the river system, we have a river manager and it is the Bonneville Power Administration. In the tug over the Endangered Species Act, the National Marine Fisheries Service is now exercising more control but the Bonneville Power Administration is not quite giving it up.

So I think it is important to recognize some of the institutional tensions that are going on here even on the issue of NMFS' role under the Endangered Species Act. But beyond that we have the problem that—

Ms. UNSOELD. You weren't suggesting that BPA was the proper—

Ms. BODI. No.

Ms. UNSOELD. OK.

Ms. BODI. Thank you for clarifying that. If I left any doubt whatsoever, I think the Bonneville Power Administration is unequivocally not the right place. I do think that because of its endangered species responsibilities the National Marine Fisheries Service has an important role to play.

I would agree with those critics on both sides of the table who would say that the National Marine Fisheries Service could do a lot better job than it has done particularly in laying out a longer term strategy and game plan—so that we know where we are going and we have a good amount of stability both for the fish and for the economic interests that need some greater certainty here too.

But the thorny question, as Ted Bottiger put it, is how do you avoid federalizing all the decisionmaking here and provide a meaningful role for the State fishery managers and for the tribal fishery

managers? So whatever we come up with is going to have to involve those Federal, State and tribal entities in cooperative management of the fisheries.

That is what we do now in harvest management. I think we need to move that approach into river management. Now the specifics of exactly what institution we have—I don't have any magic solution.

Ms. UNSOELD. Who wants to jump into that one next?

Mr. TIENSON. Let me take a stab at something anyway. To a certain extent these same problems used to play the Columbia River and the area of harvest management until the Columbia River fish management plan was negotiated over a period of time and basically enacted into law through the process of consent decree.

And that consent decree created what in effect was a new institution and there are subcommittees, technical committees, production committees and then there is a policy committee and in that policy committee said representatives of all the State, Federal and tribal agencies.

Most of the same agencies, if not all of them, also are a part of COBFWA, the Columbia Basin Fish and Wildlife Authority. You have right now a lawsuit that has effectively been transmitted into the kind of lawsuit that I think could be used as the same vehicle that we used the U.S. v. Oregon for and the U.S. v. Washington, the all citizen suit for Washington to have some kind of court-ordered and court-sponsored new institution, if you will, that basically gives the accountability. These are, after all, public agencies only that sit on them and treaty tribes unless the managers of all these agencies, all of them collectively have responsibilities over some aspect of river operations to get together and hammer out through the auspices of the court what in effect will probably become a consent decree.

In effect, we have that now and I think that is probably what you need. You still would have the accountability. It would be a public process and you would have all the players there so I guess that is the kind of thing that I would be looking for. You need both and quite clearly National Marine Fisheries Service has to be a part of it but in my view not the only one.

Ms. UNSOELD. Yes, Mr. Lovelin.

Mr. LOVELIN. I hope that we are not to the point in the Northwest that we will rely upon the leadership of a Federal judge to move us forward on this decision. I think that it is unfortunate how over the last couple of years that we all have the same desire, the same intent, and frankly we have the potential for a major Endangered Species Act success story.

And there is one common ingredient that we do have that makes it a potential and that is the money. I mean we are spending fantastic amounts of money for this effort and I just don't understand why we can't now follow behind or at least look into this scientific plan.

If we have a debate over science let us have that debate in an open manner. Let us move on to the economic side and into the social impacts of the impact to various user groups but it has to be a one, two, three step process, I believe.

I am just concerned, at this point, that certain groups are being cut out and we are using the judge's court to allow certain groups

to participate. Frankly, I will just say candidly we have too much at stake as people representing Northwest interests and the Northwest economy to sit on the sidelines and not participate in this process so I think the direction right now ought to be to let us move to a regional open process.

I am not suggesting a salmon summit but I am suggesting dialog that frankly doesn't play games and use the courts and political issues and so forth to exclude parties because I believe if we repeat that, if we continue with that kind of mode, we will repeat the spill issue and that mistake over and over again, as Al is suggesting, into the summer and into the fall and I think that is a big mistake for the region.

Ms. HAMILTON. I would like to address two points I think that are tied together with that question you asked and there is so much said today about scientific uncertainty and disagreement among scientists and all this.

But there is a very impressive document that has been put together by four States, the tribal commission and the U.S. Fish and Wildlife Service and it is called the Detailed Fishery Operating Plan.

In addition to reading the impressive document, I think the principal of those five entities, including four tribes, agreeing to sit down with their science and produce the document is a good starting point and the reason that these issues are in court is the exclusion of that science.

I am not suggesting I know how to go about formatting such a policy group for implementation and as Thane said earlier NMFS would have to be a part of that process also, but there is a large group of scientists representing fish interests in this region who could sit down and agree on science and produce a document.

Ms. BODI. The figure of Bonneville spending \$350 million on fish programs has been used repeatedly. I just can't let it go by without a short response at least.

I do agree with the idea that Bonneville Power Administration is unilaterally deciding in many cases how to spend its money on its fish program, and is not necessarily following even the blue-prints set by the Power Council. So I think there is an important debate here on the priorities for the money that Bonneville is spending out of pocket on fish and wildlife, which amounts to between \$80 and \$90 million per year, not \$350 million.

I think that is an important debate because there is, for example, as Congressman DeFazio has pointed out in his recent report, a fairly large Bonneville fish and wildlife staff, 77 people according to the DeFazio report.

And there is great potential, I think, to look at where the money is going and how it is being spent and prioritize those \$80 to \$90 million of expenditures.

But the vast majority of the money, the so-called money, that is bandied about as a Bonneville expenditure is foregone power revenues. It is important to know that those are very broad estimates. The assumptions for those foregone power revenues have not been critiqued in any kind of open way.

It tends to confuse, as Congressman DeFazio points out in his report also, the cost of a drought with the cost of salmon recovery,

for example. It puts a lot of baggage on salmon recovery that doesn't belong there.

For example, 50 percent of the Power Council's budget is put in as a salmon recovery cost as part of the \$350 million. It is completely inconsistent with how other users of the system are treated.

Navigation is not accounted for as a foregone power generation. Irrigation is not accounted for as a foregone power generation. Flood control is not accounted for in the same way. It is inequitable treatment. So I just wanted to respond because I couldn't let it go by without some kind of response.

Ms. UNSOELD. My time has really expired but did anyone else want to—Mr. Wright.

Mr. WRIGHT. I guess I have to now. Two points I think. In your question you asked the Bonneville Power Administration or others not implementing the Council's fish and wildlife program because the Council doesn't have the authority.

The fact is—at least in the form of those things that Bonneville and the other river operators respond to, and remember Bonneville is not the sole river operator, the Corps and the Bureau are involved, and the National Marine Fisheries Service is involved now—every single recommendation that the Power Planning Council has ever adopted into its fish and wildlife program have been implemented by those agencies. Every single recommendation on river operations put into the Council's fish and wildlife program has been implemented by those agencies.

Ms. UNSOELD. I bet we could have a debate on that if there were other panel members but they are not on this panel.

Mr. WRIGHT. But the second part is of the \$350 million that we talk about, Bonneville does not have the authority to spend that money. Lorri is right, \$80 to \$90 million comes out as direct revenues but it is basically mandated by the Power Planning Council and monitored by the Power Planning Council.

The power impacts, the cost of replacement energy for the river operations are the sole discretion of the National Marine Fisheries Service, at least since the adoption of the Endangered Species Act so Bonneville does not have any say in what it has to do either in the way of foregone revenues and replacement energy.

Ms. UNSOELD. My time has expired but I would observe that the decisionmaking, the implementation directing alludes this panel much as it does many of us who are also involved. We don't have the answer and we very much need not only a time for the decision to be made but the body to make the decision and it requires more than just consensus into putting it into a document.

Ms. Furse.

Ms. FURSE. Thank you, Madam Chairman. I wanted to ask Lorri Bodi but if others want to comment too, Judge Marsh spoke of major overhauls necessary in the hydro system. In your opinion, was he referring to the water scheme that the Recovery Team alludes to and what do you think would constitute the sort of overhaul that the judge was referring to?

Ms. BODI. You are asking me to read Judge Marsh's mind, but I will do my best to do that. I think that basically the judge heard testimony from scientists and experts from all sides.

He had a full record before him. He had affidavits. He also personally questioned the parties' technical experts on this issue. He felt particularly strongly, I believe, that the specific recommendations that had been made by scientists from the State agencies and the tribes were not carefully considered, were not seriously considered.

In fact, if you read the Biological Opinion it says, well, we got the agencies and tribes detailed fishery plan and we didn't have time to consider it. Though it was a 4-year Biological Opinion or five-year Biological Opinion, there was no process to even consider what the agencies and tribes had presented for subsequent years, assuming that those couldn't be incorporated into 1994 decision-making.

So I think that the guide that Judge Marsh saw was the Detailed Fisheries Operation Plan presented by the agencies and the tribes, which called for flow augmentation, spills, a movement away from barging toward in-river migration and a schedule for moving ahead with investigation of reservoir drawdown rapidly, as opposed to over a period of a decade or more.

Ms. FURSE. A question I would like to ask Mr. Wright. In your testimony you state, "There are only two legitimate recovery plans on the table." What in your mind constitutes a legitimate plan? Do you mean legitimate in law or legitimate in science and are you prepared to consider the upcoming tribal recovery plan as legitimate?

Mr. WRIGHT. The term I used and it may have been an unfortunate term, was simply to imply that the Northwest Planning Council's strategy for salmon basically emanates from the Regional Power Act and the recovery plan emanates from the Endangered Species Act, both of which have legitimacy in their nature to try to develop a salmon recovery.

I was unaware of the tribal plan and I would not be so foolish as to challenge the tribes' sovereign responsibilities under their treaties so I would of course call out a legitimate plan.

I would add I would hope the tribe would make every effort to incorporate as we are trying to incorporate the Bevan Recovery Plan and the Council strategy for salmon.

I would hope the tribes would make every effort to incorporate their plan so we don't have the warring plan problem.

Ms. FURSE. Thank you. If I may, Madam Chair, Ms. Hamilton, you spoke of a \$3 billion income. Now I assume that you are saying it is \$3 billion now under this diminished resource.

Ms. HAMILTON. Those figures are from 1991 and they were provided by the Sport Fishing Institute.

Ms. FURSE. Can you just make a guess at what you think the income from the sports fishery would be under a recovered resource?

Ms. HAMILTON. Well, we can look at some of the studies that are done per fish chasing salmon recreationally and one of the points I didn't get to make orally, it is in my written testimony, is that people who fish for salmon are addicts and they are not going to go bowling instead.

This is lost revenue to our States and there is also some documentation in my testimony done by Bill Clark of the Northwest

Marine Trade Association on the transfer of our industry to the Canadian fisheries.

But in terms of expenditures per fish I have seen figures like \$30 for a coho all the way up to \$495 per fish in Alaska and so if we wanted to be conservative and look at recovery in the Columbia River at \$100 a fish, which if I look at the thousands of dollars I have in fishing, that is a pretty low figure.

And we would look at the fact that we have lost some 10 million fish. It is staggering figures, just staggering on what the value is to the sport fishing industry. I wouldn't address what the value would be to commercial or tribal interests but just to our industry alone.

People spend tremendous sums of money in pursuit of salmon. I can't explain it. I think it is a genetic defect, I am not sure. I know I have it. Maybe it is a designer gene, I don't know.

Ms. FURSE. Thank you.

Ms. FURSE. Thank you. Mr. Tienson, what contribution do you feel that harvest plays in the salmon decline and how will additional harvest restrictions affect their recovery?

Mr. TIENSON. Even Dr. Bevan and his team acknowledged, as I understand it, that the complete elimination of U.S. fishing on salmon would not in any way bring about a recovery of the salmon even under the most favorable of their assumptions, and nobody has really contradicted that.

And that is why it is—frustrating isn't the word. I mean it is absolutely outrageous to us that once again we are being singled out as the industry that needs to carry the burden for salmon recovery.

We already have, we always will, but the 95 percent-plus burden is too darn much. It is not fair. It is not going to do a darn thing except eliminate the need to bring back these stocks to harvestable levels of abundance.

You already hear people saying, well, gee, if we get rid of the gill net fishery that means we would have more fish to trade to the Canadians, then the Alaskans. The minds are already going in that regard.

It is not fair. When those dams were created, the Mitchell Act was passed because there was an express acknowledgement and recognition that there would be decimation of the salmon run so we would need to provide some means of restoring those runs or compensating for them.

And that was in order to benefit tribal, sport and commercial fisheries and we need to recognize that and keep that in mind as we restore these stocks. We don't need to eliminate fisheries. There is no reason to. Eliminating them won't bring any salmon back. The only thing it will do is destroy coastal and river economies and the culture of the region.

Ms. FURSE. Thank you. My time has expired.

Ms. UNSOELD. I would advise the panel that I believe the staff has some additional questions they would like to submit to some of you in writing. I would thank you for coming.

I would also comment that it is clear that we don't have a simple, easily identified entity that we can point a finger at that is going to be the decisionmaking body. Therefore it is extremely important that we all work together and that we swallow some of our

natural desires to clobber each other in the common interest of putting the salmon back into its place of preeminence in the Pacific Northwest.

Thank you very much for being here.

[Whereupon, at 1:08 p.m., the Subcommittee was adjourned, and the following was submitted for the record:]

R. TED BOTTIGER
CHAIRMAN
Washington

Ken Cassavant
Washington

Ted Halleck
Oregon

Angus Duncan
Oregon

NORTHWEST POWER PLANNING COUNCIL
851 S.W. SIXTH AVENUE, SUITE 1100
PORTLAND, OREGON 97204-1337

Phone: 503-222-5161
Toll Free: 1-800-222-3355
FAX: 503-795-3370

JAY L. WEDE
VICE CHAIRMAN
Idaho

Robert (Bob) Savvik
Idaho

Stan Grace
Montana

John N. Erhart
Montana

**Testimony of R. Ted Bottiger, Chairman
Northwest Power Planning Council
before the
Committee on Merchant Marine and Fisheries
U.S. House of Representatives**

June 30, 1994

Good morning, Chairman Studds and members of the Committee. Thank you for the opportunity to testify at this oversight hearing on the recovery of threatened and endangered Columbia River Basin salmon stocks.

The Council appreciates the opportunity to comment on the Recovery Team's recommendations to the National Marine Fisheries Service. We are continuing to review the recommendations, and I am happy to offer you our analysis based on the work we have done to date.

You asked three specific questions, and we address them in detail in this written testimony. Your first question asks whether the Recovery Team's recommendations will lead to the recovery of listed stocks. As I am sure Dr. Bevan will concur, there are substantial biological uncertainties that make it impossible to answer that question with certainty. Full implementation of the Team's recommendations and the Council's salmon strategy provides the best hope not only for recovery but for rebuilding to levels that will support a sustainable fishery.

Your second question asks whether there are alternative approaches that would increase the likelihood of recovery. As I will discuss later in this testimony, the Council will be reviewing a number of additional salmon survival improvements this summer and fall. We are undertaking this review because we

have acknowledged that the existing measures in our salmon strategy are by themselves insufficient to protect all weak stocks or rebuild to fishable levels.

Your third question concerns the essential elements of a rebuilding plan. We believe that a rebuilding plan must improve salmon survival at all stages of the salmon's life cycle. In that, we concur with the Recovery Team. We believe, however, that an effective effort must also go beyond the immediate listed stocks if we are to ever get off the Endangered Species Act treadmill. In addition, we have other legal mandates including tribal treaty rights and the rebuilding obligations of the Pacific Salmon Treaty with Canada that must be addressed in the Columbia River Basin. These will require measures beyond those needed to remove listed salmon stocks from the Endangered Species list.

Many of the salmon runs in the Columbia River Basin are in deep trouble despite substantial recovery efforts to date. Arguably, the stocks that are in the worst condition are those in the Snake River that are being protected under the Endangered Species Act. This year only about 600 naturally spawning spring chinook salmon are expected to return above Lower Granite, and the outlook for summer and fall chinook is similarly disastrous.

But the combination of impacts that brought the Snake River runs to within a few steps of extinction are not unique to the Snake River. They are the same conditions that have damaged salmon runs throughout the Columbia Basin. We know there are many reasons for the decline of these runs, some human-caused, others not. The impact of dams, historic overfishing and poor hatchery practices, for example, can be blamed, and so can damage to spawning and rearing habitat. Much of the reduction in this year's runs may be attributable to the seven-year drought in the Columbia Basin and to very poor feeding conditions in the ocean. But a successful recovery program must be able to withstand unfavorable natural conditions -- just as the runs were able to withstand adverse natural conditions when they were healthy. If it doesn't, the runs will be lost. The runs are declining despite substantial regional efforts during the last 12 years to improve their survival. Twelve years is only about three generations of salmon, and so it may be too soon to gauge success.

We think it is important to take a broad view in salmon rebuilding efforts in the Columbia River Basin and not focus narrowly on the Snake River stocks. Petitions have been filed to protect fish stocks elsewhere in the Columbia River Basin under the Endangered Species Act. To us, this emphasizes the need for coordinated, basinwide recovery efforts. The ESA imposes a recovery planning process that is something like emergency surgery. To attack a problem that is so wide-ranging, the region needs a broad approach -- a holistic health care plan rather than emergency surgery to aid specific stocks.

Fortunately, the Northwest Power Act of 1980 gives us the opportunity to address the decline of salmon populations regionwide. Through this law, which created the Northwest Power Planning Council, the region developed a comprehensive program to protect and rebuild salmon and steelhead populations basinwide. It is the Columbia River Basin Fish and Wildlife Program and, particularly, that component of the program known as the "Strategy for Salmon." We completed it in late 1992, and it is being implemented.

We believe the Strategy for Salmon is compatible with at least five legal mandates that our region is attempting to fulfill. The first is the Northwest Power Act. The second is the Endangered Species Act. The third is our nation's responsibility to Columbia Basin Indian tribes under the treaties of 1855. The fourth is our nation's obligations to rebuild naturally spawning salmon runs under the U.S./Canada Pacific Salmon Treaty of 1985. The fifth is the Clean Water Act.

Efforts on all these fronts can and should proceed simultaneously and in a coordinated way. None of these mandates is less important than any other. They all aim to protect and enhance fish and wildlife populations in the Columbia River Basin, albeit to different levels.

Our Strategy is comprehensive, in that it includes measures designed to improve salmon survival at every stage of the life cycle. It is based on the best available science, as required by the Northwest Power Act. Both the Council and the Recovery Team faced the difficult task of sifting through a considerable amount of data, analyses, judgments and opinions to identify the needs of salmon. The Team's mission was to develop an Endangered Species Act recovery plan that

will rebuild and ultimately delist the Snake River sockeye, and spring/summer and fall chinook populations. The Council's mandate under the Northwest Power Act is broader: to protect and enhance all salmon stocks in the Columbia River Basin without damaging resident fish or wildlife populations and while affording the region an adequate, economical, affordable and reliable electric power supply. This mandate is reflected in our Strategy, which is a major component of the 1994 Columbia River Basin Fish and Wildlife Program. The Strategy aims to restore salmon populations throughout the Columbia River Basin to levels that will permit the region to obtain the benefits of sustainable fishery resources.

We remain convinced that it is important for the region to focus on this broad goal and address all salmon stocks in the Columbia River Basin -- not just those listed or proposed for listing under the Endangered Species Act. The Northwest Power Act specifically requires us to include measures in our fish and wildlife program that we determine will "complement the existing and future activities of the Federal and the region's State fish and wildlife agencies and appropriate Indian tribes."¹ We interpret this direction to mean that our program should be designed to protect all fish and wildlife populations in the basin and rebuild the declining stocks to harvestable numbers.

In our two-year effort to develop the Strategy, we conducted numerous hearings and consultations, evaluated substantial volumes of scientific and technical analysis and identified all immediate and longer-term actions we believed would be needed to rebuild Columbia River salmon populations to harvestable levels. Because the Recovery Team used the same information, it is gratifying and reassuring that the result of the Team's extended process in devising the recovery plan is largely consistent with the conclusions we reached in our proceedings. We believe it is vital that the region continue to implement expeditiously the provisions of the Council's Strategy.

The Strategy is a living document, as the Northwest Power Act gives us the opportunity to react fairly quickly to changing conditions and new, relevant information. As I said earlier, the Act requires that our program be "based on,

¹ Pacific Northwest Electric Power Planning and Conservation Act, Public Law 96-501, at Section 4.(h)(6)(A).

and supported by, the best available scientific knowledge.² To this end, we embrace the concept of adaptive management, which means learning by taking action in the face of uncertainty, but taking action in a way that allows you to learn as you go along. In this way, as events and knowledge change, the Council has the opportunity to make changes in the program.

This summer we are embarking on a public process that could lead to changes in the Strategy that reflect new information. In the Strategy, we said the existing measures would not be enough to protect all weak runs or rebuild to levels that would provide the benefits of sustainable fisheries. Accordingly, we called for detailed reports to be prepared on a variety of measures to improve passage of anadromous fish in their mainstem migration, including reservoir drawdowns, potential new Snake River Basin storage facilities, water efficiencies, transactions or other nonstructural measures to secure more Snake River Basin water for anadromous fish, biological rule curves to protect resident fish and wildlife populations associated with Libby and Hungry Horse reservoirs in Montana, and other matters.

All of these reports grew out of amendment recommendations that were submitted in the process of developing the Strategy. In the Strategy, we committed to review those reports in 1994, as well as any additional new information, and amend appropriate measures into the program. And there is new information, such as research on river flows and salmon migration in the mid-Columbia River and a scientific peer review of transporting juvenile fish downstream past the dams.

Meanwhile, a number of other issues have arisen in connection with the National Marine Fisheries Service's 1993 and 1994 biological opinions, the Recovery Team's draft recommendations last October, federal court proceedings, and other matters. We want to be sure we take these matters fully into account in our fall rulemaking process. We have invited recommendations regarding all measures for anadromous fish in the Strategy. These recommendations are due

² Section 4.(h)(6)(B).

to us by August 15. The Council invites Congressional participation as we work toward what surely will be a controversial decision.

We need to coordinate our planning effort with the National Marine Fisheries Service as it devises a recovery plan for Snake River salmon from the recommendations provided by the Recovery Team. We need to ensure that while the Fisheries Service develops its plan, the region continues to implement the Strategy for Salmon. We hope that as the result of our fall rulemaking and the Fisheries Service's work on its recovery plan, our two agencies can come closer together on the best measures to protect all fish and wildlife in the Columbia River Basin.

Brief comparison of the Recovery Plan and the Strategy

The Council's Strategy for Salmon and the Recovery Team's recommendations regarding Snake River salmon are mostly similar. Here are some key similarities:

- Both plans call for improved river flows.
- Both plans call for more water from the Snake River Basin and for better research on flows and the benefits of flows.
- Both plans agree that transportation of salmon in barges provides protection for some populations in poor water conditions.
- Both plans say transportation efforts and facilities need to be improved, as do bypass systems at the dams.
- Both plans largely agree on the need to protect and improve salmon spawning and rearing habitat.
- Both plans say harvest and predation should be reduced. Both also agree that alternative harvest techniques are necessary.

- Both plans call for improved hatchery production and for careful experiments to rebuild naturally spawning stocks.

In fact, there are far more similarities than differences. But there *are* differences. I will mention four here briefly, and then I will expand on them later in my testimony.

- First, the Council is concerned that the Salmon Oversight Committee proposed by the Recovery Team would duplicate a measure in the Strategy for Salmon and be too focused on the Endangered Species Act. We think it is important to avoid adding additional layers of process to the salmon recovery effort.
- Second, the Recovery Team initially proposed that the region choose either a transportation strategy or an inriver migration strategy to improve survival of juvenile fish as they migrate to the ocean. The Strategy says that while there is much regional disagreement on the benefits of transportation, it is one of the few tools the region has to improve salmon survival in the near term, especially in low water conditions. In the longer term, depending on results of continuing evaluation, transportation may be useful in the mix of techniques the region will employ to decrease salmon mortality associated with migration through reservoirs.
- Third, the Recovery Team omitted a John Day Reservoir drawdown. It is one of the additional measures the Council included in the Strategy for Salmon. While we haven't made a final decision, we believe it is not prudent to eliminate any option at this time. In the Strategy, we asked for additional study of the John Day drawdown, and we will take up the issue in our fall rulemaking.
- Fourth, I think it also is important to note that our plan is *in place*, and it is *being implemented*. It is important that the region continue to implement the Strategy while the Snake River salmon recovery plan is being developed.

The Recovery Team correctly notes there is no silver bullet for recovery of salmon populations and, accordingly, it is not surprising that their plan indicates

there are few new ideas for recovery. We reached a similar conclusion -- that no single action would produce the results desired. In fact, we earnestly believe that improvements at all stages of the salmon life cycle are required or the results will be disappointing.

For these reasons, it is logical to expect that our Strategy and the Recovery Team's recommendations to the National Marine Fisheries Service overlap in many instances. That, in fact, is the case and, in what follows, I will comment on many of those similarities and indicate some differences that appear to grow largely out of our differing legal mandates and goals.

Goals of the Recovery Plan and the Strategy

The recovery plan identifies recovery goals for Snake River sockeye and spring/summer and fall chinook. We see no reason to differ with the Team's conclusion that achieving the recommended levels of adult returns could satisfy the delisting requirements of the Endangered Species Act. Of course, as you can see from the table, the Council's goals for Snake River spring and summer chinook are substantially higher than the delisting goal of the Recovery Team.

Recovery Team delisting criteria compared to Council targets

Spring/summer chinook	
Council	Recovery Team
50,000 Spring/20,000 Summer	26,200

Fall chinook	
Council	Recovery Team
1,000	1,000

Sockeye	
Council	Recovery Team
No goal; emergency breeding program	1,000 in any one lake

This is not surprising given that the Council's goal is to go far beyond Endangered Species Act requirements and provide substantially increased and harvestable populations for the Snake River and elsewhere. Regarding fall chinook, the Council's rebuilding target and the Team's interim escapement goal are the same -- 1,000 fish.

The Council's Strategy emphasizes additional measures that, in our view, will be required to further improve salmon survival. These additional measures, which are discussed below, are designed to ensure that the Strategy addresses all stocks in the Columbia River Basin. If successful, future petitions and Endangered Species Act proceedings could be unnecessary.

The Council's Salmon Strategy also calls for the development of goals and rebuilding schedules for salmon stocks not currently listed under the Endangered Species Act. We believe this additional work will help the region identify actions needed to rebuild all salmon stocks in the basin to levels beyond those that trigger Endangered Species Act petitions and listings.

Framework

The Council is well acquainted with the dilemma the Team faced in selecting recovery measures and relating them to a recovery goal. In the Strategy, we asked the state, federal and tribal fish managers to provide us with their goals and objectives for the basin's salmon stocks. Clear goals and objectives are critical to the successful implementation of salmon recovery measures. To date we have not received this information, and we are encouraging the managers to provide it expeditiously.

While it is possible to describe individual measures, it is very difficult to say whether individually or collectively those measures achieve any given objective because our knowledge of this complex ecosystem is limited. The Team noted these difficulties in its discussion of economic issues. Nevertheless, we have found over the past 12 years that a large collection of recovery measures unaccompanied by an analytical framework poses real difficulties. Implementing agencies have a difficult time sorting out priorities; policy makers have little sense

there are few new ideas for recovery. We reached a similar conclusion -- that no single action would produce the results desired. In fact, we earnestly believe that improvements at all stages of the salmon life cycle are required or the results will be disappointing.

For these reasons, it is logical to expect that our Strategy and the Recovery Team's recommendations to the National Marine Fisheries Service overlap in many instances. That, in fact, is the case and, in what follows, I will comment on many of those similarities and indicate some differences that appear to grow largely out of our differing legal mandates and goals.

Goals of the Recovery Plan and the Strategy

The recovery plan identifies recovery goals for Snake River sockeye and spring/summer and fall chinook. We see no reason to differ with the Team's conclusion that achieving the recommended levels of adult returns could satisfy the delisting requirements of the Endangered Species Act. Of course, as you can see from the table, the Council's goals for Snake River spring and summer chinook are substantially higher than the delisting goal of the Recovery Team.

Recovery Team delisting criteria compared to Council targets

Spring/summer chinook	
Council	Recovery Team
50,000 Spring/20,000 Summer	26,200

Fall chinook	
Council	Recovery Team
1,000	1,000

Sockeye	
Council	Recovery Team
No goal; emergency breeding program	1,000 in any one lake

discussing the charter and composition of the Independent Scientific Group with Bonneville, the fisheries agencies, tribes, utilities and others. We encourage the Team to endorse this important independent scientific undertaking.

Because of our concern about the complexities of all the current processes, we urged that any institutional reforms be designed to fit with existing organizations and that all efforts be made to avoid creating additional layers of process solely for Endangered Species Act compliance. We are particularly concerned that the Team's proposed Salmon Oversight Committee duplicates activities of the Northwest Power Planning Council and the previously mentioned Independent Scientific Group. Additionally, such a committee could further diminish the role and influence of the Northwest states. The region has a long way to go in salmon recovery, but establishing yet another set of procedures is not the answer. Existing procedures must be streamlined so that the Endangered Species Act, the Northwest Power Act, the federal government's trust obligations to Indian Tribes and the rebuilding commitment of the Pacific Salmon Treaty can be addressed in a coordinated and efficient manner. Improved federal, state and local coordination is essential.

We appreciate the work of the Recovery Team, and we are ready to work with the Fisheries Service to ensure effective implementation of salmon recovery measures. But in order to be an effective partner, we need to be involved in consultations with the federal agencies under Section 7 of the Endangered Species Act. These consultations -- on dam operations, hatcheries, harvest, habitat -- concern impacts on salmon that we directly address with measures in our Strategy for Salmon. The states, through the Power Planning Council, simply must be given a meaningful, participatory role in these consultations. The Governors have requested this, and it could be done with the stroke of a pen.

Habitat and Production

In the habitat and production areas, we find the Recovery Team's recommendations compatible with our Strategy. The Team's call for uniform habitat standards fits very well with the Council's habitat performance standards. The goal of maintaining high-quality habitat while initiating actions to improve lower-quality habitat is also consistent with the Strategy.

The Team urges preparation of a habitat assessment within six months using existing information. We believe that the recently completed Columbia River Basin Subbasin Plans and the integrated System Plan should provide most of the information needed for this exercise. These plans were prepared under Council contract in the late 1980s and, while the Council has noted inconsistencies in the level and quality of habitat data, the plans were based on the best data existing at the time.

The Team also endorsed the initiation of long-term subbasin habitat management. This is consistent with the Council's direction. It is clear that the implementation of individual habitat projects, without reference to key factors limiting salmon production, likely will produce disappointing results or could be unsuccessful. Coordinated and cooperative habitat improvement is necessary and consistent with the Team's recommendations. The Council's Strategy calls for a comprehensive watershed management approach in several model watersheds around the Columbia River Basin. Our expectation in these watersheds is that focused federal, state, local and private efforts are the best hope for significant habitat improvements. In a number of areas, the Team's recommendations are more specific than the Council's Strategy, and we believe those will help further expedite habitat protection and improvement.

Our Strategy recognizes the importance of involving private property owners in improving salmon spawning and rearing habitat. We designed the model watersheds program in the Strategy around the concept that this work can be accomplished cooperatively by land owners and government, particularly the Soil Conservation Service (SCS). The SCS is providing valuable assistance in this effort, which is under way in Idaho, Oregon and Washington. Through the model watersheds, landowners are actively participating in salmon rebuilding activities. Landowners need assurance that effective actions on their part will limit their exposure to penalties under the Endangered Species Act if a stock that spawns on their property is listed.

In the production area, we share the Team's concern that hatchery practices and policies are fragmented and in need of improvement. Under the Strategy, we have charged a team of hatchery operation specialists (the Integrated Hatchery

Operations Team) to develop basinwide practices that should help improve hatchery operations and policies. Significant research efforts also are underway in the areas of fish disease, hatchery effectiveness and hatchery impacts on naturally spawning stocks. One of the two production subcommittees of the Salmon Oversight Committee proposed by the Recovery Team appears to duplicate efforts of the Integrated Hatchery Operations Team. In our comments to the Recovery Team on its draft recommendations, we suggested it would be helpful if their proposals were recast to fit with these ongoing efforts, rather than create an additional committee.

The Council sought to initiate a number of careful supplementation experiments, but the role of supplementation in rehabilitating naturally spawning populations is much debated. In the past, we have sought clarity from the National Marine Fisheries Service on the point at which supplementation or captive broodstock programs should be implemented in order to conserve naturally spawning populations. As yet, the region has achieved no clear answer on this issue.

Lacking clear direction from the Fisheries Service, the Council has assumed that supplementation will be needed to rebuild Snake River fall chinook populations. We have called for expenditure of funds to determine habitat requirements, and a considerable amount of planning has been undertaken for a supplementation project sponsored by the Nez Perce Tribe. To date, however, we have received no assurances that these activities can proceed. While we have seen some promising increases in the number of fall chinook passing over Lower Granite Dam in the past three years, rebuilding is not assured. Runs this year are expected to be very low. In short, the region needs immediate guidance on the role of supplementation and captive breeding programs. Past experience indicates that implementation of these activities takes a considerable amount of time, particularly in the current climate of uncertainty.

Downstream Survival

Improving downstream survival has proved to be the most controversial and most expensive area of our Strategy. Like the Team, we struggled with substantial biological uncertainty, generally weak data and diametrically opposed judgments

and opinions. The Strategy called for investigation of key biological uncertainties, particularly the relationship between river flows, velocity of the current and salmon survival.

Following direction in the Strategy, last fall the Council contracted with Oak Ridge National Laboratories for an independent synthesis of available information on the relationship between flows, water velocity, smolt travel time and salmon survival. The author, Dr. Glenn Cada, concluded, in part: "Despite problems with the existing data sets, the general relationship of increasing survival with increasing flow in the Columbia River Basin still appears to be reasonable."³

While Dr. Cada was conducting his review, the Recovery Team issued its draft recommendations, which started that "[t]he Team accepts the evidence that smolt travel time increases and survival decreases when flows are as low as they were in 1973 and 1977, but the evidence is less clear on what flows are needed for high survival."⁴ Following the Cada report, the National Marine Fisheries Service issued a draft biological opinion regarding operation of the Columbia and Snake River dams. The opinion included an appendix that outlined the evidence for a positive relationship between river flows and fish survival.⁵

In late February 1994, the Council conducted a technical workshop with scientific experts to discuss areas of agreement and disagreement concerning flow/velocity-survival relationships and also ways to test these relationships. This workshop helped to frame the nature of flow/velocity and transportation hypotheses the Council is considering amending into the fish and wildlife program. The Council is stating these working hypotheses in order to provide direction and impetus to high-priority scientific evaluation of these issues. The

³ Cada, Glenn F., "Review of Information Pertaining to the Effect of Water Velocity on the Survival of Juvenile Salmon and Steelhead in the Columbia River Basin," Environmental Sciences Division, Oak Ridge National Laboratory, Page 56. This report is available from the Council's central office by telephone, 800-222-3355. Please request Document 94-05.

⁴ Draft recovery plan, P. VIII-27.

⁵ Appendix B, of the Biological Opinion on 1994-1998 Operation of the Federal Columbia River Power System, "Interim Standard for Target Flow Ranges for Evaluation of Operation of the Federal Columbia River Power System Between 1994-1998," February 1994, National Marine Fisheries Service, Northwest Region, 7600 Sand Point Way, Seattle, WA, 98115.

necessity for additional scientific effort on these issues has been frequently expressed over the years in the Council's program, and elsewhere. One of the primary impediments to progress has been the difficulty of framing the question to be answered and securing agreement on methods to evaluate the flow/velocity and transportation survival relationships. In our flow/survival hypotheses rulemaking, we propose to pose the questions so that they can be openly addressed. We conducted public hearings around the region and took public comments on the proposed hypotheses through this month. We are scheduled to make a decision in late July.

Meanwhile, the Team's draft recovery plan proposed that, to improve downstream survival, the region should select either a transportation or in-river migration path as soon as possible. As things stand, the Council has not found it prudent to choose one particular approach to downstream migration over another. The Team's final recommendations are broader, urging that if smolt collection and transportation from the dams and in-river migration without drawdown of the lower Snake River reservoirs does not result in significantly improved survival, then the region should consider implementing other options -- such as drawdowns or a new smolt collection facility at the head of Lower Granite reservoir.

Available data do not point to either transportation or in-river migration as the sole means to sustain or rebuild populations. Benefits from improvements in river passage or transportation are uncertain, especially for naturally spawning stocks. In view of these considerations, we called on the region to put in place an immediate, multi-faceted program of increased flow and velocity, improved bypass, increased spill, improved transportation and predator-control measures. We believe these immediate actions could minimize the risk of failure and improve salmon survival. However, our analysis also indicates that they will be insufficient -- even when taken together with significant improvements in other areas of the life cycle -- to protect all weak stocks or reach the rebuilding goals set by the Council.

Accordingly, we said that as a matter of urgency the region should make all necessary preparations to implement expeditiously a number of additional measures: drawdowns of lower Snake River reservoirs, additional water storage in the Snake River Basin and improved water-use efficiencies. We urged that the

region proceed on the expectation that these measures will be implemented unless shown to be structurally or economically infeasible, biologically imprudent, or otherwise inconsistent with the Northwest Power Act. The Council initiated two major analytical efforts on drawdowns. First, the Council established a drawdown committee, which oversees the Corps' investigation of John Day and Lower Snake drawdowns. Second, the Corps, National Marine Fisheries Service and others are designing a biological test of the lower Snake drawdown, tentatively scheduled for 1996. The Council intends to review the results of these intensive planning efforts this year.

These additional measures could be expensive and controversial. We cautioned that a business-as-usual approach means the region will face too many unnecessary delays in the implementation of these measures, unless ongoing evaluation precludes such implementation. The measures could take years or even decades unless the region adopts more creative and aggressive means to obtain required evaluation and monitoring information, and make the essential preparations for action. It is important to keep in mind that, without these measures, it appears highly unlikely that the region can rebuild salmon populations to the levels called for in the Council's Strategy.

We are encouraged that the Recovery Team recommended many of the immediate downstream survival improvements called for in our Strategy. The Team's recommendations for continued flow augmentation, improvements in transportation and careful assessment of bypass alternatives are compatible with our Strategy and fit well with previously discussed efforts underway in this area. However, the Team is equivocal on certain improvements. We believe the region needs to overcome institutional inertia on additional mainstem survival measures if we are to get off the Endangered Species Act treadmill.

The Team omitted a measure that is in our Strategy -- investigation of the drawdown of Lake Umatilla, the reservoir behind John Day Dam. Because the region has not chosen an exclusive transportation path over in-river migration, the ability to operate John Day Dam at its minimum operating pool could benefit non-transported Snake River salmon and Columbia River migrants as well. Omitting John Day drawdown from a salmon rehabilitation effort at this time is inappropriate.

We are aware of -- and our analysis includes -- concerns about the biological and economic effects of a John Day drawdown. We have urged that the economic effects be anticipated and mitigation measures be in place prior to implementation and that a number of analyses be underway addressing biological concerns. These were reported to the Council and its Drawdown Oversight Committee in May by the Corps of Engineers in the draft System Configuration Study, Phase One. We are continuing to evaluate the draft report, a massive, multi-volume document, and I am not prepared today to offer you specific comments on the Corps' conclusions. However, the John Day drawdown is one of the issues we will take up in our fall rulemaking.

We also are aware of the Team's interest in surface bypass facilities at the dams. We are aware of the surface bypass concept, and in our Strategy we called for investigation of promising new technologies to improve salmon bypass at the dams. Surface bypass may have promise. We encourage parties to explore it fully, and we plan to take up the matter during our fall rulemaking.

We also have asked for accelerated installation of smolt detection devices at the dams and dam modifications to accommodate increased spill while reducing the potential for gas bubble trauma in the spilled fish.

Harvest

We concur with the Recovery Team that current levels of Snake River spring and summer chinook harvest are very low and appear to have no significant bearing on Snake River population levels. However, both the Council and the Team concluded that fall chinook harvest rates have been too high. The levels of reduction called for in the Strategy and the recovery plan appear similar. The Council and the Team likewise call for no commercial harvest of sockeye below the confluence of the Snake and Columbia rivers, and both request that the tribes continue to restrain the ceremonial and subsistence sockeye fishery. The Team and the Council agree that significant reductions in Canadian interception of Snake River fall chinook salmon are needed. In saying this, we understand the United States will need to reduce its interception of Canadian stocks as well.

region proceed on the expectation that these measures will be implemented unless shown to be structurally or economically infeasible, biologically imprudent, or otherwise inconsistent with the Northwest Power Act. The Council initiated two major analytical efforts on drawdowns. First, the Council established a drawdown committee, which oversees the Corps' investigation of John Day and Lower Snake drawdowns. Second, the Corps, National Marine Fisheries Service and others are designing a biological test of the lower Snake drawdown, tentatively scheduled for 1996. The Council intends to review the results of these intensive planning efforts this year.

These additional measures could be expensive and controversial. We cautioned that a business-as-usual approach means the region will face too many unnecessary delays in the implementation of these measures, unless ongoing evaluation precludes such implementation. The measures could take years or even decades unless the region adopts more creative and aggressive means to obtain required evaluation and monitoring information, and make the essential preparations for action. It is important to keep in mind that, without these measures, it appears highly unlikely that the region can rebuild salmon populations to the levels called for in the Council's Strategy.

We are encouraged that the Recovery Team recommended many of the immediate downstream survival improvements called for in our Strategy. The Team's recommendations for continued flow augmentation, improvements in transportation and careful assessment of bypass alternatives are compatible with our Strategy and fit well with previously discussed efforts underway in this area. However, the Team is equivocal on certain improvements. We believe the region needs to overcome institutional inertia on additional mainstem survival measures if we are to get off the Endangered Species Act treadmill.

The Team omitted a measure that is in our Strategy -- investigation of the drawdown of Lake Umatilla, the reservoir behind John Day Dam. Because the region has not chosen an exclusive transportation path over in-river migration, the ability to operate John Day Dam at its minimum operating pool could benefit non-transported Snake River salmon and Columbia River migrants as well. Omitting John Day drawdown from a salmon rehabilitation effort at this time is inappropriate.

project actually increases salmon survival, and so it is being pursued as an experimental demonstration.

Meanwhile, the 1994 Northern Squawfish Sport Reward Fishery is off to a fast start. Bonneville recently reported that in May, the first month of the fishery, a total of 13,453 squawfish were taken from the Snake and Columbia, and that is more than three times the amount caught in May 1993. In addition to a \$3 bounty for each fish over 11 inches long, successful anglers can compete for monthly drawings of \$1,000 and an end-of-season drawing next October of \$5,000. The \$25,000 in prize money is not from Bonneville. It's being offered by a Northwest chain of sporting goods stores, and I think that's a real public service.

In addition to squawfish, the Council also is concerned about the possible effects of mushrooming shad populations. We called for additional work on bird and marine mammal predation. The available literature does not indicate non-indigenous fish species (including channel catfish, bass, walleye, and other species) are as significant predators as squawfish, but we believe they need to be evaluated carefully.

Economics

The Council shares the Team's concern that predicting biological gains is difficult and, accordingly, that the preparation of cost-effectiveness analyses at this time is problematic. We encouraged parties to continue their work in these areas, however, so that additional information on economic impacts and regional tradeoffs can be developed.

To assist in this effort, we submitted to the Team information we prepared on implementation costs of the Strategy. The chart on the following page details the cost of our Strategy.

(In millions of dollars)

Bonneville Direct Expenses (budgeted obligations)	1991	1992	1993	1994
Salmon Measures	32.9	42.9	39.3	38.6
Wildlife Measures	3.6	16.9	6.5	6.2
Resident Fish Measures	2.4	2.5	4.3	4.3
Operations and Maintenance of Program Projects	0.7	2.3	3.8	4.5
Total	39.6	64.6	53.9	53.6

Fixed Costs	1991	1992	1993	1994
Reimbursement of Corps, Reclamation and FWS Operations ⁶	20.5	41.5	43.4	40.5
Interest, Amortization and Depreciation of Capital Projects	39.1	43.2	54.2	60.4
N.W. Power Planning Council ⁷	3.8	3.9	4.1	4.3
Total Fixed Costs	63.4	88.6	101.7	105.2

Flow Revenue Impacts	1991	1992	1993	1994
Council 1984 Water Budget ⁸	40	40	40	48 ⁹
Phase Two Flow Additions ¹⁰	0	35	74	68
ESA Flows	2	0	13	(6)-48 ¹¹
Revenue Impacts of Lowered Snake and John Day Reservoirs	0	8	25	25
Council Spill Measures	15	15	15	15
ESA Spill	0	5	5	5
1994 Emergency Spill				17
Total	57	103	172	172-226

⁶ Includes Corps O&M of fish bypass facilities, transportation program and System Operations Review costs. Includes Lower Snake Compensation Program and Reclamation O&M.

⁷ Bonneville calculates one-half of the Council budget as part of its total annual fish and wildlife costs.

⁸ Because the 1984 water budget is incorporated into firm planning, Bonneville assumes an annual value of \$40 million.

⁹ 1994 includes one-time \$8 million additional water budget cost due to earthquake interruption of DC Intertie.

¹⁰ The value of the Phase Two flow increases is estimated on the net value of the stored water less its value on the market when released. The total includes foregone revenue of operating lower Snake reservoirs to minimum operating pool and John Day to minimum irrigation pool, plus the foregone revenues of Dworshak operations.

¹¹ Source: Impacts of the 1994-98 NMFS Biological Opinion (draft); Bonneville Power Administration.

We estimated that the measures in the Strategy for Salmon likely translate into about a 4-percent increase the Bonneville Power Administration's wholesale rates. That amount could increase as additional capital obligations are incurred. The impact of the Strategy on retail electricity rates likely was somewhat less than 4 percent, depending on how much utilities choose to pass on their customers.

The Strategy is only part of the total regional cost of salmon recovery. We estimate the total cost translates into about an 8-11 percent impact on Bonneville's wholesale power rates.

No similar analysis of costs vs. rate impacts or an implementation schedule has been prepared for the measures recommended by the Recovery Team. We are ready to work with the Fisheries Service to ensure effective implementation of salmon recovery measures in the Columbia River Basin.

The costs of salmon recovery efforts are substantial, but the region also should bear in mind the cost of inaction. Without effective restoration measures, the region stands to lose wild and naturally spawning salmon stocks whose genetic resources may be critical to the long-term sustainability of all salmon runs.

We agree with the Recovery Team, whose final recommendations to the Fisheries Service conclude:

"Many of the impacts discussed above are negative in terms of social well-being. But the long-run effect of recovery of the Snake River salmon stocks to the level of delisting and beyond would be overwhelmingly positive. Jobs would return; recreational and esthetic benefits would expand; and, most importantly, a priceless heritage of the Northwest would be restored and preserved for future generations."

Conclusion

We remain convinced that the region must make an aggressive effort to protect and restore salmon populations in the Columbia River Basin. A coordinated, cooperative approach is required, or the region will be forced to react

continually to Endangered Species Act petitions and constraints. Our basinwide program is designed to enhance all Columbia River salmon stocks. We appreciate the work of the Recovery Team on listed Snake River salmon populations.

Again, I want to invite interested members of Congress to assist us in making the difficult decisions we will face this fall. We want this effort for salmon to turn out like the effort for bald eagles and gray whales. We want to avoid the spotted owl outcome.

Thank you again for the opportunity to testify here today. I would be pleased to answer any questions.

P:\JAH\Speeches\MMFTEST.DOC

Testimony of Donald E. Bevan, Professor Emeritus, University of Washington, for the Salmon Recovery Team before the Subcommittee on Environment and Natural Resources of the Committee on Merchant Marine and Fisheries United States House of Representatives. June 30, 1994

Mr. Chairman, members of the Subcommittee, ladies and gentlemen, I am Donald E. Bevan Chairman of the National Marine Fisheries Service's Snake River Salmon Recovery Team.

Mr. Chairman, with your permission I should like to enter into the Committee's record the document: Snake River Salmon Recovery Team Final Recommendations to the National Marine Fisheries Service. A Summary April 26, 1994. Chairman: Donald Bevan, Vice Chairman John Harville, Team Members: Peter Bergman, Theodore Bjornn, James Crutchfield, Peter Klingeman, James Litchfield; Recovery Plan Coordinator: Rob Jones, Recovery Team Support: Robert Clapp, Katherine Hollar, Debi Runyen, Tracey Vriens.

The complete document of final recommendations is available from the National Marine Fisheries Service.

I shall begin my presentation with our conclusions found on page 24 of the Summary document: "The recovery of Snake River salmon is a difficult and complicated public policy issue. It is important to achieve recovery and ultimately reap the social, cultural, and economic benefits of restored salmon populations. It is also important to do so in an organized, scientifically based, and economically efficient manner. The Team's recommendations provide a realistic basis for achieving these objectives. "

The team believes that the recommendations for recovery of the Snake River Salmon can form a template for the rebuilding of other Columbia basin salmon stocks and the avoidance of future listings under the Endangered Species Act.

We believe that, in combination with the Northwest Power Planning Council's Strategy for Salmon, we have a regional solution for our Columbia River salmon problems.

Are there differences in the NWPPC's Strategy for Salmon and the Team's recovery recommendations? Yes, there are some. Are the disagreements important or significant? The Team thinks not, but any disagreement is surely based upon inconsistent interpretation of uncertain science. We will not discover the truth until we monitor and evaluate initial recovery efforts for several years.

One attractive development, to measure the progress of recovery, is new technological tools for tagging and recovery to measure changes in survival.

Most important, in our view, is to expeditiously get on with the job. We must not delay because agencies, institutions, or individuals, without clear scientific direction, argue over what needs to be done.

We must begin recovery and at the same time develop better science. This is not the time to wait for research to prove a particular recovery tool is valid. Neither is it a time, as some propose, to proceed recklessly with measures whose benefits and risks are either not understood or carefully balanced. We must monitor and evaluate as we go forward and be prepared scientifically, politically and emotionally to change direction or abandon a recovery method if science shows it to be ineffective. This concept is called adaptive management.

These recommendations do not maintain the status quo. They will have considerable social and economic impacts on the region and in return we will secure the benefits of recovery. The costs will be estimated by a NMFS economic team and will be available in NMFS's draft recovery plan.

The Recovery Team's mandate is to satisfy the Endangered Species Act, but in our view such a limited recovery to achieve ESA delisting is necessary but not sufficient. If we are not successful in restoring the Snake River Salmon beyond the numbers necessary to satisfy the Endangered Species Act we will have abrogated our treaty responsibilities to the Tribes, and failed to provide the economic benefits to the region that derive from healthy stocks that permit sport and commercial fishing.

There are twelve chapters in our document. Most of the chapters are based upon science and that science should speak for itself.

In the time available today I can not review the scientific information that is the basis for the recommendations in our over 500 page report. I do want to emphasize the Team's recommendations that concern political science and specifically our recommendations for institutional change.

Institutional changes recommended in Chapter III reflect the Team's opinion that the current public policy decision-making process is seriously flawed for all aspects of Columbia Basin anadromous fishery management and research. Large amounts of resources have been invested to protect and rebuild Columbia River Basin salmonids. These efforts have not succeeded and the reasons are not hard to find.

There is no overall priority for investment decisions. Regional, state and tribal plans present a smorgasbord of measures. Some investments conflict and diminish the effectiveness of others. A large number of jurisdictions are involved. Typically four states, a number of Tribes, as many as seven federal agencies (depending on the issue) several utilities, and many coordinating and consensus building organizations are involved. In total more than 35 organizations are involved in management decisions for salmon.

Because of this complexity the region has often resorted to the lowest common denominator decision making called consensus. Often a consensus can not be reached and actions are delayed or not taken at all.

The Recovery team is convinced that the current decision-making process has lead to a "tragedy for salmon" that must be changed.

At present no one is in charge. The Recovery Team concludes that the most appropriate agency to be in charge is the National Marine Fisheries Service.

We recommend, as an essential part of the recovery process, that NMFS establish an independent science-based advisory group we have named it the Salmon Oversight Committee, that will assure that open objective analysis and peer reviewed science drive the recovery process.

The Team thinks that public policy decisions should be made in public. The responsibility and accountability for implementation should not be shared or divided among institutions. Then an informed public can judge the work of the decision makers.

Finally I want to stress the importance of consideration of all the recovery recommendations as a whole. There is no single solution. Improvements in survival must be made in all stages of the salmon's life. The recommended actions should be modified through adaptive management based on measurement of survivals.

Thank you Mr. Chairman. I will be happy to answer any questions that you may have.



**Snake River Salmon
Recovery Team:
Final Recommendations
to the National Marine
Fisheries Service**

SUMMARY
May, 1994



*Snake River Salmon
Recovery Team:
Final Recommendations
to the National Marine
Fisheries Service*

- SUMMARY

May, 1994

Recovery Team Members:
Donald Bevan, *Chairman*;
John Harville, *Vice-Chairman*;
Peter Bergman, Theodore Bjornn,
James Crutchfield, Peter Klingeman,
James Litchfield

Recovery Plan Coordinator: Rob Jones
Recovery Team Support: Robert Clapp,
Katherine Hollar, Debi Runyen, Tracey Vriens

TABLE OF CONTENTS



SETTING THE STAGE

WHY DO SNAKE RIVER SALMON NEED A RECOVERY PLAN?	1
WHY ARE SNAKE RIVER SALMON LISTED AS THREATENED AND ENDANGERED WHILE OTHER SALMON ARE NOT?	3
WHAT IS THE GENERAL LIFE HISTORY OF THE SNAKE RIVER SALMON?	3
WHAT IS THE PROBLEM—WHY ARE THE SNAKE RIVER SALMON IN TROUBLE?	5
WHAT IS THE RECOVERY TEAM AND WHAT DID IT DO?	9
WHAT IS THE GOAL OF THE TEAM'S RECOVERY RECOMMENDATIONS?	10
HOW WILL A RECOVERY PLAN BE FINISHED AND IMPLEMENTED?	10

A SUMMARY OF THE TEAM'S RECOVERY PLAN RECOMMENDATIONS

INSTITUTIONAL AND MANAGEMENT CHANGES	11
RECOVERY GOALS AND OBJECTIVES	11
SPAWNING AND REARING HABITAT	12
CHINOOK FRESHWATER PRODUCTION	14
SOCKEYE FRESHWATER PRODUCTION	16
DOWNSTREAM MIGRATION	17
HARVEST	20
UPSTREAM MIGRATION	20
PREDATION AND COMPETITION	21
ECONOMIC AND SOCIAL FACTORS	21
IMPLEMENTATION TABLE	25

SETTING THE STAGE



WHY DO SNAKE RIVER SALMON NEED A RECOVERY PLAN?

For many people, salmon are the most profound and enduring symbol of the Pacific Northwest. To the Northwest's Native American cultures, the salmon are the very heart of their societies; they mark the turning of the seasons, form a religious focus, and they literally grant life to the tribes in the form of sustenance. To the people who visit the Northwest, the salmon represent unmatched opportunities for fishing and for fish-watching as they make their great migratory runs. For citizens of the Northwest in general, the salmon embody an economic mainstay, provide a fishing opportunity right in their "own backyard," and represent one of the last living examples of the wild character so cherished by the people of Oregon, Washington, and Idaho. Unfortunately, the salmon runs are decreasing. And with each year's additional loss, a little more of the intrinsic value of life in the Pacific Northwest recedes into the past.

The Endangered Species Act, a federal law passed in 1973, requires that recovery plans be prepared for all species that are listed as "threatened" or "endangered." Species are listed when existing conditions and trends place them in danger of becoming extinct. A recovery plan is written to guide the actions needed to return species to a condition where they no longer require Endangered Species Act protection and can thus be removed from the threatened or endangered list.

Snake River sockeye salmon were listed as an endangered species on November 20, 1991. Snake River spring/summer and fall chinook salmon were listed as threatened on April 22, 1992.

Many factors played a part in reducing these salmon populations to the point where they needed to be listed as threatened or endangered: creation of dams and reservoirs in their migration corridors, loss and deterioration of their spawning and nursery habitats, disease, predation, excessive harvest, water being withdrawn from streams for other uses, and impacts from hatchery fish, are among the myriad causes.

Snake River sockeye salmon were reduced in abundance more than the other salmon. During the 1950s and 1960s, as many as 4,360 adult sockeye returned to Redfish Lake to spawn. In 1992, only one adult sockeye returned to Redfish Lake, and in 1993, eight returned.

Snake River fall chinook salmon have also declined to small numbers. At the uppermost Snake River dam with fish passage, an average of 12,700 salmon passed the dam from 1964 through 1968. Fish passing the dam fell to a low of 78 in 1990, and then increased to 533 in 1992, and 742 in 1993.

Exact numbers of naturally produced Snake River spring/summer chinook salmon are harder to obtain because many hatchery spring/summer chinook salmon have been released in the system. However, from 1950 through 1960, approximately 125,000 naturally produced adult spring/summer chinook salmon returned to the system yearly. Estimated returns of natural spring/summer chinook averaged less than 10,000 from 1980 through 1990, and were approximately 3,400 in 1991 and 1992, and 7,900 in 1993.



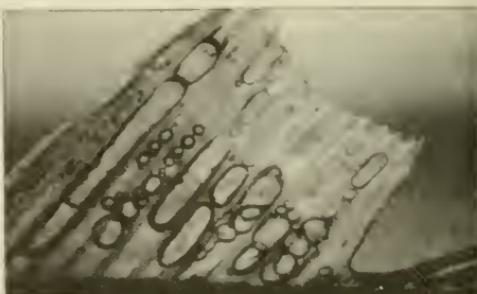
Bonneville Dam spilling excess water during 1948 flood.
(Photo from NMFS)



Two sockeye salmon on a redd (spawning nest).
(Photo by Gregory Ruggerone)



Habitat destroyed by dredging and
rechanneling during mining. (NMFS Photo)



Close up of fish fin with gas bubble disease -
induced by deep plunging of air during large-scale
spills at a dam. (NMFS Photo)



All three salmon species have been reduced to small fractions of their former abundance. These populations are so low that without protection under the Endangered Species Act (including a recovery plan) they are likely to soon disappear.

WHY ARE SNAKE RIVER SALMON LISTED AS THREATENED AND ENDANGERED WHILE OTHER SALMON ARE NOT?

Five species of Pacific salmon exist in North America: sockeye, pink, chum, chinook, and coho. Biologists usually use the names of the rivers in which the salmon are found and the seasons when the adult salmon return to their spawning grounds to further categorize these five species. This results in hundreds of "stocks" or "runs" of the five salmon species. For example, the chinook salmon stocks include Sacramento River winter chinook salmon, Columbia River summer chinook salmon, Klamath River spring chinook salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon, to name but a few.

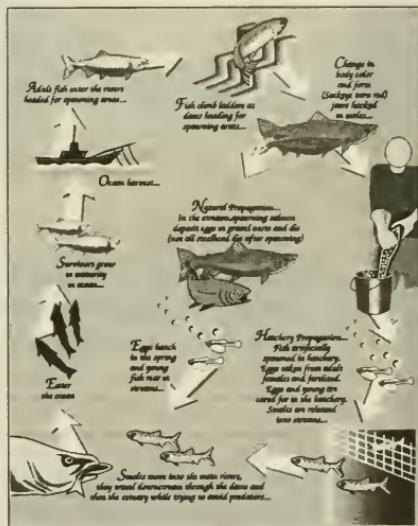
When reviewing the status of different stocks, the National Marine Fisheries Service reviews biological information to determine if a stock or group of stocks represent an "Evolutionarily Significant Unit" of the species. The Snake River sockeye salmon were found to be an evolutionarily significant unit and thus are listed as an endangered species. The Snake River sockeye salmon evolutionarily significant unit is made up of both anadromous sockeye and the residual (non-migratory) sockeye population now found only in Redfish Lake, Idaho. (Anadromous fish are those that are born in freshwater, migrate to the sea, and return to freshwater to spawn.)

The Snake River spring/summer chinook salmon were also determined to be an evolutionarily significant unit. The run is made up of more than 30 subpopulations located in 12 major subbasins and Salmon River tributaries. The Snake River fall chinook evolutionarily significant unit is made up of a single population which spawns in the mainstem Snake River and the lower reaches of major tributaries downstream from Hells Canyon Dam; plus the Lyons Ferry Hatchery population, which was derived from the natural stock.

WHAT IS THE GENERAL LIFE HISTORY OF THE SNAKE RIVER SALMON?

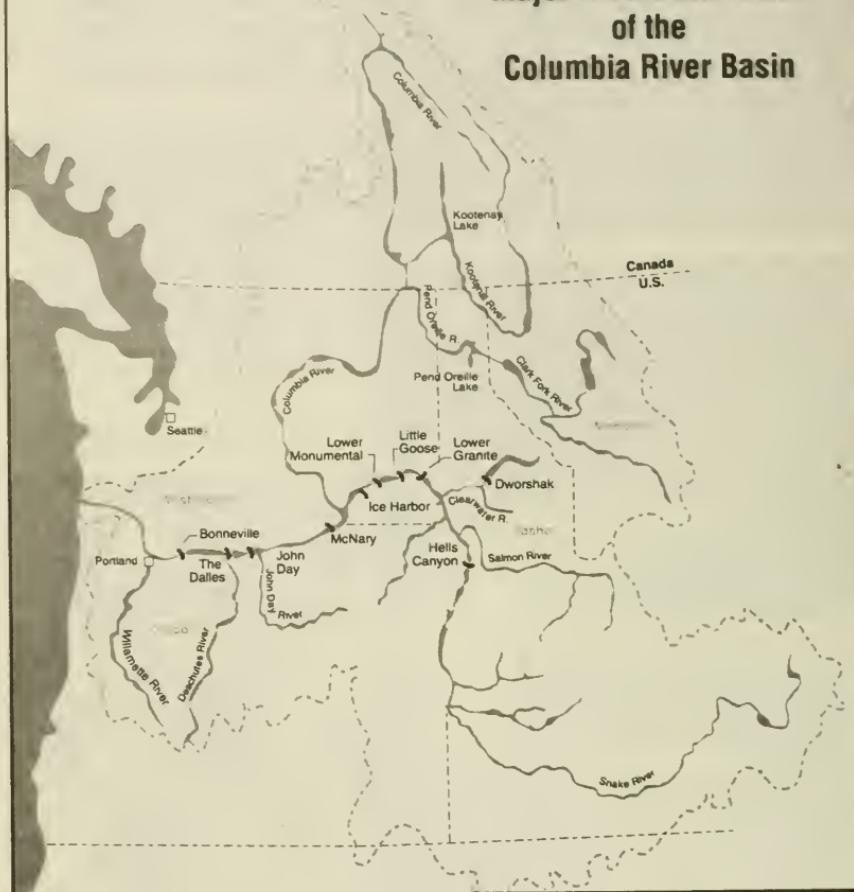
Salmon have fascinating and complex life histories. They travel as much as 900 miles upriver and climb to elevations of 6,500 feet to reach spawning grounds. Snake River chinook and sockeye salmon share the same general life cycle. Eggs are deposited and fertilized by spawning adults in gravel "nests" (called redds) in the summer and fall. After the juveniles emerge from the redds, they use the stream or lake they were born in as nursery areas. Sockeye and spring/summer chinook live in these nursery areas for one to two years before migrating seaward, but fall chinook live in their nursery area for only a few months. In the spring, the sockeye and spring/summer chinook smolts leave their nursery areas and start migrating to the ocean. Fall chinook salmon leave their nursery areas and start migrating to the ocean early in the summer.

The Snake River salmon range from California to Alaska and venture into the high seas of the Pacific where they



Salmon life cycle (Corps of Engineers)

Major Rivers and Dams of the Columbia River Basin





Salmon returning upstream to spawn.
(NMFS Photo)



Cluster of salmon redds.
(NMFS Photo)

grow and mature. Snake River salmon usually spend two to three years in the ocean before they return to freshwater. Snake River sockeye salmon enter the Columbia River in June and July and return to Redfish Lake to spawn. Spring/summer chinook salmon enter the Columbia River from March through July and return to their natal streams to spawn. The spring/summer chinook that migrate early in the year tend to spawn in the upstream reaches of the tributary streams, while those arriving later spawn in the lower reaches. Fall chinook salmon enter the Columbia River from August through October and return to the mainstem Snake River and lower reaches of major tributary streams to spawn.

WHAT IS THE PROBLEM— WHY ARE THE SNAKE RIVER SALMON IN TROUBLE?

There are many causes of the salmon stocks' decline in abundance: dams, water use, overharvest, habitat destruction, hatchery impacts, and other human-induced factors all play roles in reducing the Snake River salmon populations. No single factor is responsible for the full extent of the decline, and no single action will restore them. No "magic bullet" or single-purpose "fix" exists to recover these salmon populations.

Stream silted in by road washout.
(Photo by Jeff Lockwood)



Riparian area severely degraded by cattle grazing. (Photo by Jeff Lockwood)



One of the problems is institutional. The many agencies and Indian Tribal interests involved in salmon management in the Columbia River basin represent different constituent groups and have different perspectives and approaches to salmon conservation. No one is in charge. Institutional, jurisdictional, state, and federal boundaries make overall fisheries management decisions difficult, if not impossible. Such trans-jurisdictional decisions require consensus; that consensus is difficult to achieve. Each agency has its own area of designated authority and responsibility, gets its own funding, sets its own goals, and develops its own special projects and agendas, all of which are dependent upon individual budgets.

In many of the Snake River salmon watersheds, the problems begin before the salmon emerge from the gravel. Land use activities such as logging, grazing, mining, and

road building may smother the redds (salmon nests) with silt or sediment. Livestock may step directly on a redd and kill the salmon eggs. Once the young salmon emerge from the redds, hatchery fish may eat the wild salmon, be a source of disease, or compete with them for food and living space. Logging may eliminate streamside trees which would otherwise fall into the water and create good habitat for the salmon. Land use activities, such as removing stream-shading trees, may increase water temperatures to levels that are lethal for the juvenile salmon. Livestock grazing often removes vegetation near streams and thereby reduces stream bank stability.

Once the salmon are ready to migrate to the ocean, they face the problems associated with the hazardous downstream journey. This journey through the lower Snake and Columbia rivers has become more hazardous since eight



hydroelectric dams were completed and their reservoirs were created. Seventy percent of the 471 miles from the mouth of the Columbia River to Lewiston/Clarkston on the Snake River has been converted from free-flowing river into reservoirs.

Juvenile salmon (called smolts when they are ready to migrate seaward) must find their way through the reservoirs and pass the dams. Smolt-to-adult survival rates of Snake River salmon stocks have declined to the point where they equal about one-fourth the rates observed in the 1960s, and migration time for smolts from the Snake River to the Columbia River estuary has doubled. The longer the smolt migration time, the greater the risks of predation and disease.

Smolts may pass the dams through different routes; those passing over the spillway or using the bypass systems have higher survival rates than those that pass through the turbines. Improvements in bypass systems at several of the dams have helped make passage safer for the fish. Before the dams were built, flows in the spring were higher and even in years of low flow, there was sufficient current to carry the smolts to the sea. Then, as now, most of the smolts migrated at night which might be a way of avoiding predators.

Not only did the dams slow the rate of downstream travel for smolts, they increased the amount of habitat favorable to predator species and provided physical conditions that improved the predators' ability to detect and capture juvenile salmon. Hatchery fish and exotic species have also been introduced into the system, and they compete with, and prey on, chinook and sockeye.

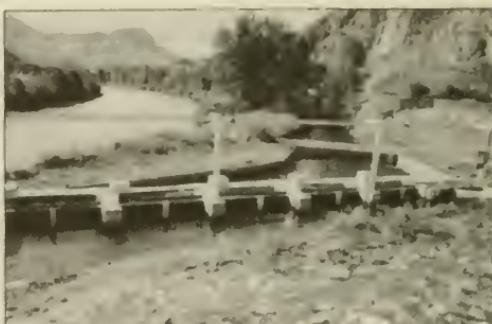
The construction of hundreds of large and small reservoirs has physically altered the original hydrology of the Columbia River Basin. The flows for the lower Snake and Columbia rivers have been changed from natural conditions to those considered more desirable for human uses. The large late-spring and early-summer runoff and small late-autumn and winter flows have been changed so that now there is a much smaller spring-summer runoff. A complex management system has been developed to manage the basin's reservoirs and flows. The system was primarily developed to control floods, provide water for irrigation, and serve the hydropower system by storing water for use when power demand is high.

In addition to the sections of the rivers that have dams, the 146 mile section of free-flowing Columbia River downstream from Bonneville Dam, and the Columbia River plume that extends into the Pacific Ocean have been altered in ways that may reduce the survival of smolts migrating to sea. Little research has been conducted on the effects of reduced flows and turbidity on the survival of smolts in the lower Columbia River and the estuary. However, it seems likely that reductions in flows and turbidity in the spring have not only increased the smolts' travel time, but also added to their risk of predation on their way to the estuary. Reductions in flow have also decreased the size of the river plume extending into the ocean (an environmental factor which offers the smolts some concealment from predators when they first reach the ocean).

Little is known about survival rates of salmon once they enter the Pacific Ocean, but there is growing evidence that survival rates are not uniform from year to year and that variations in ocean productivity may affect stocks over a



John Day Dam
(Corps of Engineers Photo)



Irrigation diversion.
(NMFS Photo)



Setting a purse seine.
(NMFS Photo)

wide geographic area and for an extended period of time. Annual variability and the possible presence of long-term trends in the ocean environment make it difficult to detect changes in survival that result from agencies' efforts to improve inland conditions.

When the salmon begin their upstream migration as adults, they again face harvest by commercial and recreational fisherman and predation by marine mammals. Passage through the dams also presents a problem. Biologists are able to count salmon as they use the dams' fish ladders on their way upstream. Large numbers of salmon "disappear" in between dams. The reasons these adult fish disappear include: mortality, unreported and illegal harvest, fish falling back over the dams after being counted in the fish ladder of a previous dam, straying or wandering, and spawning in reservoirs and their tributaries.

The causes of mortality include: predation and wounding by marine mammals, injuries from fishing gear, water pollutants, exposure to water supersaturated with dissolved gases, high water temperatures, large spillway discharges, diseases, and other mortality. Additional mortality may result from injuries received when the fish "fall back" downstream and go through turbines, bypass systems, spillways, or navigation locks.

When the adult salmon return to the area where they emerged from their parents' redd, they again face habitat problems. Spawning beds may be silted in with sediment from logging, mining, or roadbuilding, or the water may be too warm for them. In addition, human activities may unintentionally scare them away from the spawning beds.

Seattle, Washington; Newport, Oregon; and two in Portland, Oregon. In addition, the Team consulted extensively with resource managers, tribal representatives, environmental groups, and various industries, and invited participation from all interested parties at 27 public meetings convened in Idaho, Oregon, and Washington.

On October 20, 1993, the Team sent a draft of the recovery recommendations to fellow scientists and managers and asked them for a peer review. The purpose of this review was to ensure that the factual materials were correct, and that the Team's analyses and interpretations were scientifically sound. The requested input was due on December 6, 1993, and approximately 170 comments were received. The Team's present recommendations incorporate revisions based on these comments and updated information and analysis.

WHAT IS THE GOAL OF THE TEAM'S RECOVERY RECOMMENDATIONS?

The goal of the Team's recovery recommendations is to restore the Snake River salmon to naturally reproducing self-sustaining populations. Once that is achieved, they will no longer face the serious risk of extinction that caused their listing as threatened or endangered under the Endangered Species Act. However, the Team also recognizes and supports the idea that one day the Snake River salmon should go beyond Endangered Species Act-mandated recovery and once again generate harvestable surplus that will contribute to the social, cultural, and economic benefit of the Pacific Northwest.

In order to delist the Snake River salmon, survival should be improved in every segment of their life history. Recovery must address the total sequence of habitats and life history stages, not simply concentrate on a single type or aspect of action. Moreover, it is important to remember that actions taken at one stage in the life cycle will almost certainly have consequences in another life stage.

Thus, the Team decided that a holistic life-cycle approach must be taken, with the intent being to focus on improving survival at each life stage so that the sum of all improvements will turn the trend toward recovery of self-sustaining productivity. Also, the Team intends that significant improvements in such factors as fish passage and ocean survival will directly benefit any anadromous species sharing those critical environments with the listed salmon.

The Team's recovery efforts are coordinated to address salmon productivity in each phase of the life cycle of the stock and in every part of the habitat: spawning and rearing habitats, tributary and mainstem migration corridors, ocean harvest, and interactions with marine mammals are addressed. Recovery efforts are focused on the life-cycle segments where human influence can be effective, and those points of focus may differ by species and by area. However, the Team notes that it is essential that the protection and restoration process be carried out on the ecosystem as a whole—blending into one effort the various emphases on individual environmental components.

HOW WILL A RECOVERY PLAN BE FINISHED AND IMPLEMENTED?

The National Marine Fisheries Service will review the Team's recommendations and develop a Recovery Plan. The Recovery Plan will be made available to the public. The National Marine Fisheries Service will solicit public comments from all interested parties and consider these comments in developing a final Recovery Plan.

The final Recovery Plan will not be self-implementing under the Endangered Species Act. Instead, it will be used by National Marine Fisheries Service to guide the various agencies in refining their management plans, procedures, and strategies. This is so that individual on-the-ground operations will act in conjunction to help achieve recovery of the listed species. The Team's recommendations include an implementation schedule which, if followed, will expedite progress toward recovery. National Marine Fisheries Service' final Recovery Plan will also contain such a schedule.

Given that the Team's recommendations call for use of adaptive management, and many of the recovery actions will be addressed over an extended period of time, the Team recommends that a new group (the Salmon Oversight Committee) be established to guide implementation efforts over the long term (See Institutional and Management Changes, next page).



WHAT IS THE RECOVERY TEAM AND WHAT DID IT DO?

Following the listing of Snake River sockeye salmon, the National Marine Fisheries Service appointed the Snake River Salmon Recovery Team to independently develop recovery plan recommendations. After the Snake River spring/summer and fall chinook salmon were listed as threatened species, the Team's responsibilities were expanded to include them as well. The Team includes three biologists, two engineers, an ecologist and an economist (see Table 1). National Marine Fisheries Service is not represented on the Team.

Although the Team's specific charge was to draft recovery plan recommendations for listed Snake River salmon, the recommended recovery actions were developed while keeping conservation of other Columbia River Basin fish and wildlife in mind as well. In general, the Team proposes recovery strategies for conserving the ecosystems upon which these species depend; this is felt to be the best method for increasing the species' abundance to the point where Endangered Species Act protection is no longer needed.

The Team independently developed their recovery recommendations by compiling all available information through an open, public process. Over the course of 27 months, the Team visited areas in the range (past and present distribution) of the listed Snake River salmon, and sought scientific, cultural, and economic expertise from parties throughout the region. Information accumulated by the Team has been compiled into an administrative record available for public inspection at five different locations throughout the Pacific Northwest; these are: Boise, Idaho;

Table 1. Recovery Team Members and Background

Donald E. Bevan, Ph.D., Chairman	Professor Emeritus of Fisheries and Marine Affairs. Former Dean and Director, College of Fisheries, University of Washington. Former member Pacific and North Pacific Fishery Management Council's scientific and statistical committee, former member North Pacific Fishery Management Council.
John P. Harville, Ph.D., Vice Chairman	Ecologist. Retired. Executive Director, Pacific Marine Fisheries Commission. Member of the Pacific and North Pacific Fishery Management Councils. Initial Director, Moss Landing Marine Laboratories of California State Colleges.
Peter K. Bergman, Ph.D.	Fishery Biologist, Manager of Biological Research, Northwest Marine Technology. Executive Director, Salmon and Steelhead Advisory Commission. Retired Chief of Salmon Management, Washington Department of Fisheries.
Theodore C. Bjornn, Ph.D.	Fish Biologist, Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho. National Biological Survey, Dept. of the Interior.
James A. Crutchfield, Ph.D.	Natural Resource Economist, Professor Emeritus, University of Washington, Economics and School of Marine Affairs. Vice-President, Natural Resource Consultants. Former member and Chairman, Pacific Fishery Management Council.
Peter C. Klingeman, Ph.D.	Professor of Civil Engineering, Oregon State University. Specialist in hydraulics, hydrology, river engineering, impact assessment, and river basin planning and management.
James W. Litchfield	Power Engineer, Private Consultant in Energy. Former Director of Power Planning for the Northwest Power Planning Council. Led the development of the Northwest Conservation and Electric Power Plans in 1983, 1986, and 1991.

A SUMMARY OF THE TEAM'S RECOVERY PLAN RECOMMENDATIONS



INSTITUTIONAL AND MANAGEMENT CHANGES

The Team makes two recommendations for improving the decision-making process for Columbia-Snake River Basin salmon concerns throughout the range of the fish. The Team believes these actions are necessary to achieve recovery, to prevent further listings, and certainly to minimize costs and accelerate progress.

Future management must emphasize disciplined coordination, teamwork, and communication. The Team intends that a single organization be empowered to make final decisions when consensus can not be obtained. The Team concludes that the most appropriate agency for this responsibility is the National Marine Fisheries Service.

The Team also believes that an impartial, independent, science-based group should be responsible for ensuring that the Columbia-Snake River Basin management system for anadromous fish works effectively in setting priorities, ensuring a scientific basis for decisions, and promoting relevant science. The Team recommends that an independent five-member oversight committee—called the Salmon Oversight Committee—be formed to fill this critical decision-making void. This group will recommend investment priorities for anadromous fish expenditures in the Columbia-Snake River Basin, and work with all affected federal, tribal, regional, state, and private entities to ensure conformance with the goals and objectives of the Recovery Plan. Such an entity would help to make certain that relevant permits and biological opinions issued by National Marine Fisheries Service are consistent with Recovery Plan priorities. Furthermore, the Salmon Oversight Committee would resolve jurisdictional disputes, provide oversight for Recovery Plan implementation, advise the National Marine Fisheries Service when changes are required in the Recovery Plan, form specific scientific sub-groups, and provide coordination with scientific sub-groups which are already in existence.

RECOVERY GOALS AND OBJECTIVES

The Team's recovery requirements and delisting criteria for Endangered Species Act-listed Snake River Basin salmon fall into two major categories: (1) remedy of the environmental (and other) factors that have reduced the stocks to levels with a high probability of extinction; and (2)

rebuilding populations to levels where there is evidence of improved productivity, even when considering the potential impacts of severe stochastic environmental events (e.g., protracted drought, oceanic El Niño effects, etc.).

The Team believes that after applying the recovery recommendations, it will require at least two to three salmon generations (eight to twelve years) to assess the recovery of Endangered Species Act-listed salmon stocks. Population trends must be carefully evaluated, and increases can be considered to be significant only when accompanied by the environmental improvements specified in the Team's recommendations.

A spawner-spawner ratio of 1 (i.e., one pair of parental spawners to one pair of next-generation spawners) means that the population is neither increasing nor decreasing. If the ratio remains less than 1 for extended periods, the population is in decline, and could continue into extinction—a risk which has led to Endangered Species Act listing of Snake River salmon. For population rebuilding, the spawner-spawner ratio must be greater than 1.

As a criterion for population recovery leading to delisting (based on spawner-spawner ratio and habitat use); the Team proposes the following.

For each listed "species," the spawner-to-spawner ratio should achieve a geometric mean greater than 2.0 (= 2:1) over at least two generations (approximately eight years), and habitat seeding as measured by spawner abundance or parr densities should show similar increases in levels of abundance and use of available spawning and rearing habitats. These criteria should be applied both to the species in aggregate and to component subpopulations selected as subbasin indicators of species recovery. Evaluation of stock recovery trends must incorporate risk-assessment processes to guard against influencing conclusions through factors which are extraneous to true recovery.

Based on historic considerations, the Team suggests the following as alternative delisting criteria for spring/summer chinook salmon.

Spring/summer chinook salmon delisting may be considered when an eight year geometric mean of naturally produced adult fish passing over Ice Harbor Dam approximates a reasonable fraction (e.g., 50%) of the average number passing over that same dam in a base period of 1962-1967; and when spawner abundance or parr densities in subpopulation watersheds approach equivalent proportions of the 1960s levels of abundance and habitat use.



Sockeye salmon on the spawning grounds.
(Photo by Gregory Ruggerone)

The 1962-1967 counts of spring and summer chinook salmon round to a mean of 52,400 (from a range of 26,900 to 65,800). Fifty percent of that average would give a tentative delisting target of 26,200 naturally produced adult spring/summer chinook salmon passing over Ice Harbor Dam yearly (eight year average count).

The Team suggests that the Northwest Power Planning Council's rebuilding target for fall chinook—1,000 returning spawners per year—should serve as an interim escapement objective until better information becomes available and decisions are made concerning reestablishment of fall chinook populations in the Clearwater and/or Upper Snake rivers.

For sockeye, delisting will be recommended when naturally self-sustaining populations of sockeye salmon have become established in at least two Stanley Basin lakes and have produced an average of 1,000 spawners over a period of at least two generations (8 years) in one of those lakes. (The population level in the second lake should achieve at least half that number.) The reason two lakes are specified is to guard against catastrophic loss of the stock. While this requirement will extend the time and increase the cost of achieving delisting, the Team considers this safety factor essential to ensuring long-term recovery of the sockeye.

Snake River sockeye populations should trend generally upward, and average spawner abundance should demonstrate spawner-spawner ratios that exceed 1:1 during the rebuilding phase (in accordance with the rationale for delisting Snake River chinook discussed earlier).

The Team emphasizes that this delisting criterion (1,000 and 500 naturally produced sockeye returning to any two of the

Snake River Basin lakes) must not be confused with the recovery goal for Snake River sockeye. That goal is the reestablishment of sockeye populations "in all possible lakes in the Snake River Basin," and the Team expects that the overall recovery program will seek to serve that goal.

SPAWNING AND REARING HABITAT

The Salmon Recovery Team believes that now is the time to establish a unified position with respect to preventing further habitat degradation: any further exploitation of resources on public lands should be precluded unless it can be shown that no further harm will befall critical salmon spawning and rearing habitats. The upriver habitats are critical for spawning success, egg survival, and fry emergence and growth.

Habitat protection (and the immediate benefits thereof) can best be achieved if federal land management agencies (such as the U.S. Forest Service and Bureau of Land Management) impose an immediate moratorium on all resource exploitation on federal lands where there are risks of measurably degrading listed salmon spawning and rearing habitats. Risk of degradation and habitat loss should be evaluated in terms of the habitat protection standards developed by Forest Ecosystem Management Assessment Team, PACFISH (an interagency strategy for managing anadromous fish watersheds), and the Eastside Forests Scientific Society Panel, though some adjustments may be necessary when applying the standards east of the Cascade Mountains. These standards include riparian buffer zones of



The Salmon River.
(Photo by Robin Waples)



Clearcutting next to a stream.
(Photo by Nick Iadanza)

specified dimensions along salmon spawning and rearing streams, related protection of tributary drainages, and elimination of sediment and water temperature increases created by road building, logging, and grazing on critical watersheds.

The Salmon Oversight Committee should convene a habitat subcommittee whose role would be to provide coordinated advice, counsel, and information sharing to all groups implementing habitat-affecting actions under the Recovery Plan. One of the first tasks of the Habitat Subcommittee should be to develop a preliminary status assessment of salmon spawning and rearing habitats. Such a study would determine the most urgent protection and restoration priorities.

The Team commends the objectives defined by Forest Ecosystem Management Assessment Team and by PACFISH for protecting and restoring salmonid spawning and rearing habitat. The Team recommends that habitat restoration actions address the following issues: fish mortality and streamflows at irrigation diversions, salmon habitat degradation caused by animal grazing and stock holding enclosures, water quality and forest practices, existing water quality laws, stream degradation from mining and other non-forestry activities, recreational activities that may inhibit Snake River salmon propagation and population recovery, water quality conditions throughout the salmon migration corridors, law enforcement, and habitat research and monitoring.

In addition to the preliminary status assessment, the Habitat Subcommittee should perform detailed inventories and assessments for each subbasin. These assessments may take two to five years to complete and must involve private sector resource users (recreational fishing and conservation organizations, cattle grazers, farmers, logging interests, etc.).

Habitat protection and restoration actions intended specifically for sockeye salmon spawning and rearing habitats are also recommended by the Team. Recreational use of the Stanley Basin Lakes should be managed to minimize human impacts on the Snake River sockeye salmon. Barriers to Stanley, Pettit, and Yellow Belly Lakes must be removed or modified. Fertilization experiments in the Stanley Basin Lakes should be conducted.

CHINOOK FRESHWATER PRODUCTION

Improving upriver production is one of the essential elements of stock rebuilding and, ultimately, recovery. The Team focuses on three general areas of action for improving freshwater production. First, protection and restoration of spawning and rearing habitat must receive high priority, since the ultimate goal is recovery of naturally spawning and propagating chinook salmon populations. Second, institutional mechanisms that will ensure coordinated action throughout the Snake River Basin must be put in place (and ideally, they should embrace the Columbia River Basin as a whole). Third, improvements must be made in hatchery operations; though it is important to remember that the only true measure of recovery is the viability of natural populations.

The Recovery Team believes that hatchery objectives and operations must be critically examined and revised where necessary to assist, not impede, natural salmon productivity. Some hatchery operations may need to be shifted to conservation objectives instead of concentrating on production. The reason for this is that hatchery operations have historically been highly uncoordinated. They are authorized under differing agencies (federal, state, and tribal) and they serve varying objectives. There is a need to establish a single authority for overseeing all such operations in the Columbia and Snake River basins.

The habitat assessment studies called for in the spawning and rearing habitat recommendations should be expanded to cover the long term. Studies must be planned, funded, and carried out to quantify egg-to-fry and fry-to-smolt survival rates for each stock and watershed. These data are essential for establishing seeding rates and juvenile salmon carrying capacity on a stock-by-stock basis.

The Salmon Oversight Committee should have two production subcommittees. One should address natural production needs and problems; the other should be concerned with hatchery programs and operations. The Natural Production Subcommittee's function should parallel that of the Basin Oversight Group proposed by the Northwest Power Planning Council, and these groups should either be merged or designed to be closely interactive. A Hatchery Subcommittee should be established immediately. It should be composed of experts in relevant specialties including fish health, behavior, genetics, experimental design, information management for complex systems, and logistics of running hatcheries. The



Good habitat on the Imnaha River.
(Photo by Jeff Lockwood)



Effects of mining. Note lighter patch of rocks in right center - which are covered with metal oxides precipitated out of the tailings bank to the back of the photo. (Photo by Nick Ladanza)



Spawning Chinook .
(NMFS Photo)



Fish sampling for marking at Dworshak Hatchery. (NMFS Photo)

subcommittee should ensure that a Columbia Basin-wide integrated hatchery plan is developed in a manner consistent with the overall management objectives of the recovery recommendations.

A principal product of this coordinated approach to improved chinook production must be a set of standards and guidelines. Some areas and their stocks should not receive hatchery intervention. Natural processes should restore stock strengths as adults return in increasing numbers (due to improvements made at other stages in the life cycle—as is presently the case for the Middle Fork of the Salmon River). Stocks in other areas may need hatchery fish supplementation, but with carefully planned safeguards that take into full account the risks and problems of that kind of intervention. Carefully planned, monitored, and evaluated experimental approaches will be needed in selected areas to improve the Region's ability to use these artificial

supplementation processes correctly and effectively. The entire Snake River ecosystem must be safeguarded against ecological disruption and overload resulting from poor use of the hatcheries.

SOCKEYE FRESHWATER PRODUCTION

Given the tiny anadromous stock of remnant sockeye salmon present in Redfish Lake, the highest immediate priority must be to prevent extinction and save the gene pool. A captive broodstock program for that purpose was initiated by the National Marine Fisheries Service and Idaho Department of Fish and Game prior to the creation of the Snake River Salmon Recovery Team. The program is designed to rear progeny from returning adults to maturity, and thereby use protection in the hatchery to avoid the environmental hazards of natural rearing. If successful, the higher survival rate of hatchery-reared fish should produce large numbers of next-generation juveniles for outplanting to "jump-start" natural propagation processes. Redfish Lake outmigrant smolts which may have anadromous ancestry are included in that captive broodstock program, and so are the offspring of the newly discovered Redfish Lake residual sockeye stock.

The Recovery Team endorses the sockeye captive broodstock program as an emergency measure, and has devoted considerable attention to extending it and specifying its purpose and methodology. In addition, the Team feels that the present program should be expanded to other hatcheries in order to "spread the risk" of possible detrimental effects. The Team recognizes the experimental nature of the program, and understands that significant adverse genetic (and other) effects can result from hatchery rearing over a full generation. However, these risks are justifiable in view of the alternative, which is almost certain extinction of the remnant anadromous stock. The Team is concerned about survival rates of fish being reared and the available facilities for the broodstocks program.

The Team emphasizes that the ultimate goal must be to restore naturally propagating anadromous sockeye populations to lakes of the Stanley Basin and, where appropriate, to other lakes in the Snake River drainage. The captive broodstock program can only provide initial stocking for those lakes. A key long-term recovery goal is to terminate the captive broodstock program. Only natural production can be counted for delisting purposes, and only long-term self-sustaining natural production will satisfy the goals of any recovery plan.

This long-term recovery goal will take several decades to accomplish and evaluate. The earliest significant releases of progeny from the captive broodstock program will be 1994-1995, and survivors from those releases will return to spawn one to three years later. Their offspring will be the first



Water supply and raceway at a hatchery. (NMFS Photo)

from that lineage to spawn in the wild. Their lake rearing, seaward migration, and return to the spawning grounds will require the subsequent three to five years. Peak production from the captive broodstock program will lag some years beyond the initial production. It will be well into the next century before the natural productivity derived from captive broodstocks can even begin to be evaluated.

Two subcommittees should be formed to assist the Salmon Oversight Committee with the sockeye captive broodstock program. A Genetics Protocol Workgroup should be formed to assist the Stanley Basin Sockeye Technical Oversight Committee in developing the necessary protocols for selective breeding and appropriate broodstock record-keeping. A Fish Culture/Fish Health Working Group should also be created. This working group will also assist the Stanley Basin Sockeye Technical Oversight Committee; it will help to develop standard operating procedures and protocols for fish rearing and disease control.



The Team recommends the development of different parental stocks, experimentation with different release ages, experimentation with releases into different lakes, and comprehensive monitoring of all the broodstock strategies.

DOWNSTREAM MIGRATION

The Team recommends several major types of action for improving downstream migration survival: extend the survival research to individual stream reaches, improve water budget volumes (and their use) to provide the maximum benefit for salmon, reduce dam passage mortality, improve the salmon transportation program, and investigate longer-term actions to improve smolt survival.

The absence of supporting scientific information was a recurring problem the Team faced in establishing the strategies and specific tasks for recovery. For downstream passage, continuation and expansion of the current survival studies is mandatory. The results of this research will help develop water budget priorities, determine the effectiveness of flow augmentation, and provide a benchmark for evaluating transportation improvements.

To improve water budget management and maximize migrant survival, the Team recommends that the National Marine Fisheries Service coordinate all water budget releases. The National Marine Fisheries Service should be in charge of releasing water from Dworshak Reservoir in Idaho. The Team believes that Dworshak Reservoir should be operated to give first priority to threatened and endangered salmon. Flow augmentation has been an

important component of the region's fisheries management strategies, and it continues to be an important part of the Team's recovery recommendations. The use of reservoir water for flow augmentation will change as future information is collected and decisions are made as to what flows are needed to achieve the various individual biological objectives.

The Team believes the Northwest Power Planning Council's water budget concept is valid in that it allows for real-time decision making as the actual flow and fish migration conditions evolve. As these conditions develop in a particular water year, National Marine Fisheries Service and the Salmon Oversight Committee must determine how best to use reservoir storage. For example, in a year with early runoff, the best course of action may be to save the water until flows are low and fish are still migrating in the river. In other years, it may be necessary to use the water early to offset a cold spring and delayed natural runoff. In high runoff years it may be unnecessary to use the water in the spring. Instead, it can be saved for release in July, August, and September in order to determine the value that reservoir temperature modification has for fall chinook salmon juveniles and adults. Water, like any scarce resource, should be managed continuously throughout the year, and real-time decisions based on the best scientific information and judgment are the best way to ensure that the available water provides the maximum biological benefit.

Because there is a lack of information on which to base a scientific decision on the size and timing of the water releases, the Team used the water budget volumes that are included in the Northwest Power Planning Council's Strategy for Salmon as a starting point. However until additional research is conducted, it is impossible to determine whether these volumes (and the timing of their releases) are the best possible for improving smolt survival.



Spill for juvenile passage at a dam.
(NMFS Photo)

The Team encourages minimal water budget use in the spring so that more can be used in the summer to aid fall chinook migrants. The National Marine Fisheries Service and the Salmon Oversight Committee should review the effects of water budget operations on fish survival and determine whether to continue, increase, or decrease the size of the water budgets.

To reduce dam passage mortality, the Team recommends that all passage routes be evaluated at each dam. Spill from the surface of the reservoir and surface collection facilities should be considered, and state-of-the-art bypass systems should be installed. Detailed, dam-by-dam audits of the bypass and collection systems should be conducted.

In the Team's view, improved smolt collection at the Snake River dams and transport to the lower Columbia River (along with in-river migration when suitable conditions exist) is the option that must be used until better options are developed. The Team recommends that: the National Marine Fisheries Service should manage the smolt transportation system, the Corps of Engineers should continue to operate the collection and transport facilities, the biological basis for in-river smolt migration should be developed, the National Marine Fisheries Service should coordinate hatchery releases and logistical strategies for transportation, barges should be designed to lower stress, barge exits should be modified to allow dispersed release, research should be conducted to evaluate various release sites in the Lower Columbia River, and strategies should be developed to reduce predation in the areas of release.

One of the Team's longer-term recommendations for the downstream passage problem is to investigate building a new fish-friendly smolt collection system near the head of Lower Granite Reservoir. From there, the smolts could be transported past the dams. A new collection facility of this nature would be needed if sufficient improvements cannot be made in the collection and bypass facilities at the dams, if losses in Lower Granite Reservoir are relatively high (up to 30%), or if flow/velocity changes through the reservoirs are insufficient to create the conditions needed for a high degree of survival.

The Team has considered, and rejected as a significant recovery action, the current plans to draw down John Day Reservoir below minimum irrigation pool. However, drawdown of Lower Granite Reservoir should be evaluated using survival data that will be collected during the next two to three years to determine if more fish will reach Lower Granite Dam where they can be collected. If the survival data indicate that there might be biological benefits from



Cross-section of a typical dam.
(Corps of Engineers)

Smolt transportation barges. (Photo by Evan Greger)





Tribal harvest.
(NMFS Photo)



Salmon troller.
(Corps of Engineers Photo)

drawdown, a valid test should be designed, the necessary structural modifications should be made, and the test should be conducted. The region should continue to plan and evaluate the option of drawing down all four Snake River dams to river level, so that informed decisions regarding this option can be made in the future. Drawing down the four Snake River reservoirs to river level should be contemplated if recovery cannot be achieved by the other options. In considering such an option, there should be reasonable evidence that smolt survival rates are significantly higher when the Snake River reservoirs are drawn down to river level than they are with the other options.

The Team believes that ocean conditions and the various components of marine ecosystems affect growth and

survival of salmon of all species, and therefore ultimately affect adult returns to their natal rivers. While many of these factors lie beyond human ability to control, they must be taken into account in recovery planning. The near certainty that slow-growing, poor-condition smolts are the ones at greatest risk upon ocean entry is of particular importance for the recovery of weak stocks. The clear message for salmon recovery planning is that the best assurance of ocean survival rests upon the quality of the smolts, not their quantity.

HARVEST

The Team recommends that harvest management should be changed to reduce both harvest rates and capacity for all the listed stocks. This should be accomplished by decreases in quotas and/or fishing times and places, accompanied by a buy-back program to reduce fishing capacity in ocean troll, charterboat, and in-river gillnet fisheries. By the year 2002, the only harvest that should be allowed in any Columbia River fishery should be selective harvest with live release capability, and fishing for hatchery stocks in terminal areas should be encouraged.

The Team also recommends that both ocean and in-river fisheries management focus on rebuilding the listed stocks. Both the United States and Canada need to give higher priority to threatened and endangered stocks and adopt a coordinated harvest program under the Pacific Salmon Treaty. Fisheries in the Columbia River need to limit harvest of weak stocks and conserve the Snake River salmon.

For fall chinook, the Team recommends that the total harvest (ocean and in-river) should be limited to no more than 50% (though initially, the rate should be lower). All other fisheries that result in incidental take of fall chinook should be limited, and all management decisions and policies should increase annual escapement until 1,000 "wild" (non-hatchery) fall Chinook return to Lower Granite Dam annually.

All directed and incidental harvest of sockeye must be eliminated below the confluence of the Snake and Columbia rivers. The Team requests that the Tribes reduce ceremonial and subsistence harvest of Snake River Sockeye and release all marked Snake River sockeye.

UPSTREAM MIGRATION

The Team believes that adult salmon migrants should receive the highest priority for protection, as they have already survived most of the risks in their life cycle and are close to their final destination—the upstream spawning grounds. Unless management attention is given to the causes and solutions of what may be a 25-30% or more loss/mortality rate for adult salmon between Bonneville Dam and Lower Granite Dam, and 50% or more by the time adults reach natal spawning grounds, a large proportion of the Snake River salmon entering the Columbia River may not survive the upstream migration phase. Upstream adult migration past the dams is a complex issue. Flow and operation conditions change frequently at the dams and can affect passage of individual fish. Seasonal and year-to-year conditions of temperature and water clarity can also affect adult passage.

To improve upstream passage conditions, the Team recommends that adult fishways and dam operations be changed. Flow augmentation should be evaluated for use in improving water temperatures for adults in the Snake River. Adult passage evaluations should be expanded. Adults should be protected with fisheries law enforcement. Wider-ranging disease control possibilities should be explored. Experiments involving adult collection and transport should be conducted.

John Day fish ladder.
(NMFS Photo)





Seal rookery - marine mammals are salmon predators. (Corps of Engineers Photo)



Early-era gillnetter on the Columbia River.
(NMFS Photo)

PREDATION AND COMPETITION

Team recommendations for controlling predation and competition problems include the following. The existing squawfish control program should be revised to progressively reduce predation on smolts. The National Marine Fisheries Service should be in charge of the squawfish control program and should develop more effective methods for capturing squawfish. Sport harvest of non-native species in waters where the listed species are found should not be restricted by bag limit or size. Non-native species should not be stocked in listed salmon habitat. Hatchery steelhead releases should be managed to minimize impacts on the listed chinook and sockeye. Hatchery trout

should be stocked in streams with listed salmon only when it can be demonstrated that they will not affect the listed species' growth and survival. Impacts from bird and marine mammal predation should be assessed, and control methods should be designed.

ECONOMIC AND SOCIAL FACTORS

The Team is keenly aware of the public concern over the potential costs of meeting delisting goals for Snake River sockeye and chinook. However, the Endangered Species Act is very specific in its direction for a recovery plan: such a plan is to be based on scientific factors only.

Economic costs are to be considered only to the extent that less costly options are to be chosen where equal biological benefits are expected from several alternatives. In addition, the overall costs of major recommended actions should be estimated where possible.

The Team has concentrated on a thorough evaluation of the various elements that might contribute to recovery of the listed Snake River species. Many of these factors cannot be assessed individually because the effectiveness of each is dependent upon the execution of others. The Team's recovery recommendations place heavy emphasis on flexibility in adapting to future developments, research findings, and monitoring; thus, estimates of cost will doubtless vary over time as activities are implemented or abandoned.

The direct and indirect costs of recovery actions could not be estimated within the Team's time constraints, but they are too important to be neglected. Reservoir management is likely to have far reaching impacts on recreation, residential use, power production, transportation, and the incomes of coastal communities heavily dependent on ocean and in-river fishing.

Therefore, the Team recommends that National Marine Fisheries Service give high priority to undertaking or commissioning a detailed study of the direct and indirect social and economic effects of proposed recovery actions.

The Team can only provide its best summary of the actions that, when taken together, offer promise for delisting (and hopefully, will engender progress toward providing harvestable surpluses). Detailed analysis of, and public comment on, any economic and social effects resulting from

Recreational fishing boats at the confluence of the Willamette and Columbia rivers.
(NMFS Photo)



Sport fishery on the Columbia River.
(Corps of Engineers Photo)





the implementation of proposed recovery actions will be addressed during the formal process the National Marine Fisheries Service will follow when developing their recovery plan for Snake River salmon.

The Team recommends a wide range of measures that are bound to affect many individuals and businesses in the Pacific Northwest. The Team recognizes that the most immediate social disruptions are likely to occur in the river and troll fisheries and the communities that rely upon them. If drawdown becomes a preferred option in the future, it too will have substantial social impacts. Barge traffic would be interrupted to varying degrees, depending on the length of the drawdown-refill period. Shippers would have to reorganize storage and shipping schedules, relocate facilities, and, in some cases, shift to rail for all or part of their transport requirements. Drawdown to riverbed might spell the end of barge traffic on the Snake River and result in serious dislocation and hardship in the Lewiston/Clarkston area.

The impact on farming and related activities also depends on the extent of drawdown. Spillway crest operations would involve some change in marketing farm products, and would require further investment in pumps. Neither would appear to pose a threat to continued farming in the present locations. Full drawdown, however, might well impact irrigated agriculture (and its dependent communities) enough to cause real hardship and forced relocation.

Some recreational facilities and storage reservoirs located on the Snake River will be eliminated or closed down for part of the year under any level of drawdown. The social costs would entail the loss of some preferred recreational locations and the possibility of enforced closure of some operations.

Flow augmentation requirements will alter reservoir levels enough to affect recreational and scenic values for visitors and residents, with unpredictable timing. The situation at Dworshak Reservoir could be particularly serious, since its use as the primary source of water for flow augmentation and temperature control would result in wider and more frequent fluctuations of reservoir levels than in the past.

Some of the habitat improvement and predator control measures recommended by the Team could have social impacts on user groups and residents. It may be necessary to eliminate or reduce trout stocking in Stanley Basin lakes where predation on sockeye (or competition for food or space) is possible. Depending on the degree of restriction, this could reduce the overall attraction of the area as a recreational and tourism center, thereby creating adverse effects for both visitors and residents. However, the impact

on visitors would be minimized by the availability of good trout fishing in numerous Stanley Basin lakes and streams that are not part of the salmon recovery actions.

The proposed restriction on further expansion of non-indigenous fish (black bass, walleye) into waters where they would compete with (or prey on) listed salmon stocks would have both positive and negative effects. Fishermen targeting the introduced fish would prefer to see their range extended, while salmon fishermen would benefit by reducing these fish populations in areas of conflict. It is also possible that the recovery measures might require modification of steelhead enhancement programs in some areas, another decision that would pit user groups against one another.

Though there has been much public comment about the adverse effects of recommended grazing and water use restrictions on Stanley Basin residents, the Team notes that most of its recommendations amount to little more than enforcement of existing laws and regulations. Incorporating salmon recovery plans into the larger arena of sub-basin planning would be useful.

Many of the Team's recommendations regarding protection of stream beds and riparian zones, avoidance of sensitive areas by boaters and fishermen, etc., are already being observed on a voluntary basis by river users in spawning and rearing areas.

Any increase in electricity rates has unpleasant consequences for large numbers of householders and businesses. The Team does not find, however, that major losses of employment or inter-regional shifts in jobs or industrial location are likely to result from increased electricity rates due to any of its recommended actions. The aluminum industry is perhaps the most sensitive to costs of electric power, but the rate increases that may be required for recovery (full drawdown excepted) are not the principal causes of its economic troubles. World-wide production and inventories are the primary causes of low aluminum prices.

There are real social benefits to be found in assisting management agencies to mount a vigorous and continuing law enforcement effort that supports the recovery plan. All anadromous and resident fish stocks would benefit, as would the groups that utilize them. Better control of unlawful activities benefits both the fish and the people of the region. Tighter enforcement of regulations on water quality, forestry practices, and irrigation diversions (to mention only some of the related watershed problems), would also be of wide benefit to the public.

Many of the impacts discussed above are negative in terms of social well-being. But the long-term effect of bringing



Tributary to the Salmon River. (Photo by D.R. Orcutt)

back the Snake River salmon stocks would be overwhelmingly positive: jobs would return; recreational and aesthetic benefits would expand; and, most importantly, a priceless heritage of the Northwest would be restored and preserved for future generations. The Team has attempted to speak for these silent beneficiaries in devising a plan that can ward off the imminent threat of extinction and lay the groundwork for perpetuating self-sustaining runs that will benefit the region and the nation.

In short, there will be social and economic costs with any recovery plan broad-based enough to get the job done, and every effort should be made to identify and ameliorate those costs as far as possible. But from the longer view, these are investments in treasured natural assets of profound importance to the people of the Northwest.

CONCLUSION

The recovery of Snake River salmon is a difficult and complicated public policy issue. It is important to achieve recovery, and ultimately to reap the social, cultural, and economic benefits of restored salmon populations. But it is also important to do so in an organized, scientifically based, and economically efficient manner. The Team's recommendations provide a realistic basis for achieving these objectives.



This set of recommendations, developed by the Snake River Salmon Recovery Team, does not constitute a recovery plan, and as such, has not been approved by the National Marine Fisheries Service or by any other agency. The conclusions and recommendations stated here are solely those developed by the Recovery Team. The Team's recommendations are not intended to provide precise details on all aspects of Snake River salmon management. This is not a "decision document" as defined by the National Environmental Policy Act and does not allocate resources on public or private lands.

The following table summarizes the specific measures recommended by the Snake River Salmon Recovery Team. Readers are encouraged to refer to the complete recommendations for an understanding of these measures and the rationale the Team used to develop them.

INSTITUTIONAL CHANGES

Task	Priority	Duration
1. Place NMFS in charge.	1	Ongoing
2. Establish Salmon Oversight Committee.	1	Ongoing
3. Designate working subcommittees.	2	Ongoing
4. Institute comprehensive monitoring and evaluation.	2	Ongoing

HABITAT

Task	Priority	Duration
1. Place an immediate moratorium on resource exploitation on public and private lands which impose risks of measurable degradation of spawning and rearing habitats in watersheds nurturing listed salmon stocks.	1	Ongoing
2. Designate a Habitat Subcommittee.	1	Ongoing
3. Immediately assess present status of salmon spawning and rearing habitat as a basis for setting urgent priorities for protection and restoration.	1	6-9 months
4. Implement habitat protection and restoration actions for all "species" with respect to:	1	Ongoing
a. Irrigation diversions	1	Ongoing
b. Grazing and stock-holding	1	Ongoing
c. Water quality and forest practices	1	Ongoing
d. Mining and other developments	1	Ongoing
e. Recreational activities	1	Ongoing
f. Migration corridors activities	1	Ongoing
g. Law enforcement	1	Ongoing
h. Habitat research and monitoring	1	Ongoing
5. Initiate long-term subbasin habitat management planning with extensive interagency and public participation in the planning process:	2	2-5 years
a. Encompass ESA-listed and at-risk stocks	2	2-5 years
b. Begin with in-place and in-process plans	2	2-5 years
c. Regional/local task group composition	2	2-5 years
d. Emphasis on prime targets for improvement	2	2-5 years
e. Provisions for monitoring	2	2-5 years

HABITAT (CONT.)

Task	Priority	Duration
6. Implement specific habitat protection and restoration actions for sockeye salmon: <ol style="list-style-type: none"> Control recreation activities in critical spawning and rearing areas Remove or modify barriers to migration Conduct lake fertilization experiments 	1 2 2	Ongoing 1-3 years 1-3 years

CHINOOK PRODUCTION

Task	Priority	Duration
1. Protect and improve spawning and rearing habitat for all Snake River chinook salmon.	1	Ongoing
2. Consider use of three areas to reestablish viable naturally self-sustaining fall chinook salmon populations in the Snake River Basin.	2	2-3 years
3. Establish coordinating mechanisms.	1	Ongoing
4. Improve hatchery contributions to recovery of natural stocks. <ol style="list-style-type: none"> Develop comprehensive plans and implement regionally. Supplement stocks according to natural stock protection protocols. Use captive broodstocks carefully to forestall extinction. 	2 2 1	Ongoing Ongoing Ongoing
5. Improve health and general quality of hatchery production fish.	1	Ongoing
6. Reduce or modify hatchery production where necessary to minimize ecological pressures on natural stocks.	1	Ongoing

SOCKEYE PRODUCTION

Task	Priority	Duration
1. Continue operation and development of captive broodstock programs derived from four separate parental stocks.	1	3-7 years
2. Locate and equip adequate numbers of hatcheries to house projected numbers of captive broodstocks.	1	1-2 years
3. Maintain captive broodstocks through a second generation, where necessary, to ensure sufficient total production for significant magnitudes of releases into target lakes.	2	3-7 years
4. Release broodstock progeny generally into the lake of origin, at density levels within conservative carrying capacity limits and in accordance with research protocols ensuring long-term monitoring and evaluation.	1	3-5 years

SOCKEYE PRODUCTION (CONT.)

Task	Priority	Duration
5. Undertake long-term monitoring and evaluation of the captive broodstock program production of juveniles, alternative times and life stages of outplanting, and adult returns as the basis for program improvements, and decisions concerning continuation.	1	3-8 years
6. Designate Genetics Protocol Group and Fish Culture/Fish Health Working Group.	2	Ongoing
7. Investigate biological and economic feasibility of Wallowa and Warm lakes for reintroduction of anadromous sockeye.	3	1-3 years
8. Develop a protocol for fostering natural production in lakes selected for sockeye stock restoration, and for hatchery assistance to supplement the rate of population growth, toward the ultimate goal of termination of hatchery assistance and reliance on natural production to sustain the stocks at viable population levels.	1	1-3 years

DOWNSTREAM MIGRATION

Task	Priority	Duration
1. Continue the expanded smolt survival studies begun in 1993.	1	Ongoing
2. Install PIT tag detection equipment at additional dams in the Lower Columbia River and develop techniques for sampling tagged fish downstream from Bonneville Dam.	1	1-5 years
3. Study in-river migration to determine when smolts should not be transported.	1	1-5 years
4. The National Marine Fisheries Service should manage and direct the collection and transport program.	1	Ongoing
5. The Army Corps of Engineers should continue daily operation of the collection and transport program.	1	Ongoing
6. Develop better methods for counting fish in bypass and Holding facilities.	1	1-3 years
7. Acquire additional barges to facilitate transport and permit testing of release strategies.	1	1-3 years
8. Develop better exit portals on the barges.	1	1-3 years
9. Test release strategies and locations downstream from Bonneville Dam.	1	1-6 years
10. Initiate tests to determine the flows needed to improve survival in Lower Granite Reservoir.	1	1-6 years
11. Develop and improve bypass systems and operations at each dam.	1	1-6 years
12. Continue to evaluate extended-length screens and install them at Snake River dams if appropriate.	1	Ongoing
13. Direct and coordinate release of stored water in Dworshak and upper Snake River reservoirs.	1	Ongoing

DOWNSTREAM MIGRATION

<u>Task</u>	<u>Priority</u>	<u>Duration</u>
14. Evaluate survival data to determine if a test drawdown of Lower Granite Reservoir is needed, if so, design and make the necessary dam modifications.	1	2-3 years
15. Negotiate for additional water from the upper Snake River.	2	1-6 years
16. Design and evaluate surface collection systems.	2	1-6 years
17. If a suitable test can be designed, test the drawdown of Lower Granite Reservoir.	2	1-4 years
18. Determine if a smolt collection facility is needed at the head of Lower Granite Reservoir.	2	1-2 years
19. Study the actions needed to introduce salmon above Brownlee Reservoir.	2	1-4 years
20. Explore the feasibility of reintroducing salmon above Dworshak Reservoir.	2	1-4 years
21. Continue to plan and evaluate the option of drawing down all four Snake River dams.	2	1-3 years
22. Consider building surface collection systems.	3	5 years
23. If smolt collection and transport do not work, consider other options.	3	Ongoing
24. Consider building a collection facility at head of Lower Granite Reservoir.	3	1-3 years
25. Consider drawing down the four Snake River reservoirs to 33 feet below MOP.	3	1-5 years
26. Consider drawing down the four Snake River reservoirs to river level.	3	1-4 years
27. Re-establish salmon above Brownlee and Dworshak reservoirs if feasible.	3	Ongoing

HARVEST

<u>Task</u>	<u>Priority</u>	<u>Duration</u>
1. Sockeye.	1	Ongoing
a. Request the tribes to release marked sockeye and to cap or reduce the take of sockeye in ceremonial and subsistence fisheries.	1	Ongoing
b. Eliminate directed commercial fishing for sockeye below the confluence of the Snake and Columbia rivers until selective fishing is developed.	1	Ongoing
c. Modify the Columbia Fisheries Management Plan to address explicitly the conservation of Snake River sockeye.	1	1 year
d. Strengthen enforcement programs in the harvest sector.	1	Ongoing

HARVEST (CONT.)

Task	Priority	Duration
2. Spring/Summer and Fall Chinook.		
a. Modify the Columbia River Fisheries Management Plan to address explicitly the conservation of Snake River spring/summer and fall chinook.	1	1 year
b. Require gear that can capture fish alive (and permit release of selected individuals). Eliminate gillnetting in the Columbia River by 2002 unless gillnetting is agency-certified as live release-capable with an acceptable mortality rate.	2	8 years
c. Manage designated headwaters for hatchery production specifically for fishery harvest. Gillnets would be permitted in these waters.	2	Ongoing
d. Cap the total exploitation rate of ocean and river fisheries for Snake River fall chinook at 50%. Initially, rates should be less than 50% of the levels of recent years.	1	Ongoing
e. Meet the four brood year average target of voluntary returns of fall chinook to Lyons Ferry hatchery plus natural fish counted over Ice Harbor or Lower Granite Dam.	1	Ongoing
f. Reduce fishing capacity with voluntary "buy-back" programs in the non-Treaty river fishery (Zones 1-5) and the ocean fisheries off Oregon (north of Humpback Mountain) and Washington. If target reductions of at least 20% annually in production capacity are not achieved by voluntary tenders, the buy-back should be mandatory.	1	8 years
g. Press for a reduction in Canadian catches of threatened Snake River fall chinook through international negotiations.	1	1 year
h. Strengthen enforcement programs in the harvest sector.	1	Ongoing

PREDATION/COMPETITION

Task	Priority	Duration
1. Reduce squawfish predation.	2	Ongoing
2. Reduce shad population.	2	Ongoing
3. Reduce predation by other non-indigenous fishes.	2	Ongoing
4. Reduce negative effects of steelhead.	2	Ongoing
5. Reduce negative effects of trout.	2	Ongoing
6. Reduce bird predation.	2	Ongoing
7. Reduce marine mammal predation.	2	Ongoing

UPSTREAM MIGRATION

Task	Priority	Duration
1. Continue (and expand) efforts to better evaluate survival and intendam losses for adult salmon migrating upstream, including behavior in fishways and methods to reduce fallback at dams.	1	Ongoing
2. Make immediate improvements in the physical and operational conditions of adult fishways at dams along the lower Snake and Columbia rivers for use at present pool elevations, emphasizing those actions that do not require extensive planning, design, or implementation time.	1	3 years
3. Start immediate planning and design to implement additional passage improvements in the physical and operational conditions of adult fishways for use at present pool elevations.	2	5 years
4. Continue vigorous fishery law enforcement and explore approaches for its long-term use in protecting recovering stocks by deterring illegal fishing.	1	Ongoing
5. Determine if the Snake River water budget should be used to improve passage conditions (by reducing water temperature) in the lower Snake River at times when adult fall chinook salmon are present. Determine if this can be done through late-summer flow augmentation water from Dworshak Reservoir.	2	3 years
6. Determine the best flow management to protect adult upper migrants against potential problems due to dissolved gas supersaturation resulting from spills at dams, including daily monitoring when spills cause dissolved gas supersaturation levels to exceed 110%.	1	Ongoing
7. Analyze potential problems and determine the best options for adult passage at dams, should reservoir drawdown be implemented for juveniles. Include evaluation of the physical and operational requirements to maximize the effective use of the adult fishways at dams with reservoir drawdown.	2 or 3	3 years
8. Investigate the possibilities of drug treatments to control diseases such as BKD in adult salmon as they migrate upstream.	3	3 years
9. Explore new ideas, including collection and transportation, for improving adult upriver migration conditions or for giving a short-term boost in survival during critical phases of recovery.	3	Ongoing

TESTIMONY OF THE COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
BEFORE THE ENVIRONMENT AND NATURAL RESOURCES SUBCOMMITTEE OF THE
HOUSE MERCHANT MARINE AND FISHERIES COMMITTEE
IN WASHINGTON, D.C. ON JUNE 30, 1994
CONCERNING RECOVERY OF COLUMBIA BASIN SALMON

Chairman Studds and members of the Subcommittee, thank you for the opportunity to present the views of the Columbia River Inter-Tribal Fish Commission on Columbia Basin salmon recovery. My name is Levi J. Holt, and I am Chairman of the Nez Perce Fish and Wildlife/Water Subcommittee.

As you know, the Columbia River Inter-Tribal Fish Commission is composed of the fish and wildlife committees of the Yakama Indian Nation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of the Umatilla Indian Reservation and the Nez Perce Tribe and was formed in 1977 for the purpose of coordinating management policies and providing technical expertise to its member tribes. The member tribes of the Commission are successors in interest to the tribes and bands that ceded millions of acres of land in the Columbia Basin in return for the treaty promise of the United States to secure the tribes' fishing rights, both on-reservation and at all usual and accustomed fishing places. These traditional territories are the areas where the salmon of the Columbia Basin have been most diminished and where they must be restored if we are to regain the fisheries that sustain Indian people and that have sustained fisheries throughout the Pacific Northwest including off-shore fisheries in Canada. (Attachment 1 - Ceded area map).

You asked that we comment upon salmon recovery and I trust you mean recovery of salmon throughout the basin rather than only the recovery of the listed chinook and sockeye populations of the Snake River basin. Populations of basin salmon species are linked and the Snake River populations are not the only declining or extinguished populations in the basin. Commission fishery scientists, Phil Mundy and Jeff Fryer, carried out a study of stock status in the basin in 1992. Based on a review of 400 chinook spawning escapement surveys they concluded that only 26% of the surveys were at seeding levels above 50%, while more than half were at levels of no more than 20% of full seeding. (Attachment 2 - Mundy and Fryer). Thus, despite the rebuilding goals established under law in the Pacific Salmon Treaty, the Northwest Power Planning Council's Fish and Wildlife Program and the U.S. v. Oregon Columbia River Fish Management Plan, the region's state and federal agencies are not doing their job. And, they are certainly not living up to the treaty obligations of the United States to the Commission's member tribes.

More importantly, the damage can be predicted to worsen. The attached graphic depicts the pace of population loss during the last fifteen years and predicts additional populations that will be lost if we do not begin a comprehensive restoration program immediately. (Attachment 3 - Predicted population losses).

The diminished status of Columbia Basin stocks was recognized by the Power Council during discussion of its Fish and Wildlife Program during the 1980's. The Council wisely embarked upon a recovery planning effort in 1987 with the adoption of its doubling goal and subbasin planning. However, following the completion of subbasin recovery plans for the thirty-one subbasins of the Columbia and the expenditure of \$5 million, the Council set the plans aside in 1990 and turned its attention primarily to the listed stocks of the Snake River basin. The Council's Strategy for Salmon provides general guidance for basin-wide recovery, but it did not provide the action plans for individual subbasins that were intended by the 1987 Fish and Wildlife Program.

We know that salmon recovery works if our governments have the will to support and implement it at both regional and watershed levels. In the Umatilla Basin, the Confederated Tribes of the Umatilla Indian Reservation, local irrigation districts, and the state and the federal government teamed up in the early 1980's to restore chinook runs that had been lost for seventy years because of an irrigation dam. The parties fixed degraded stream segments, improved flows, removed obstructions, maintained wilderness spawning and rearing areas, and outplanted appropriate stocks to the basin. Over the past five years, we have had dramatic increases in both chinook and coho populations as the outplanted populations began to naturalize in the Umatilla system. (Attachment 4 - Salmon and steelhead returns to the Umatilla Basin).

Restoration, though, is not limited to one tributary of the Columbia. Priest Rapids fall chinook, Wenatchee sockeye, Imnaha spring chinook are all populations that have benefitted from watershed approaches that combine habitat protection and enhancement with scientifically based propagation and transplanting techniques.

But these projects can not succeed without gravel-to-gravel management where we as societies are concerned about the salmon at every stage of their life cycle. At the basin-wide level, salmon need flows between, and safe passage at the hydro projects. There is no question that our salmon were depleted as each federal mainstem dam was completed. (Attachment 6 - Salmon vs. Dams graphic). I hope you found it a little odd that the hydro operators and industries were accusing the White House and the fishery agencies and tribes of wanting to kill salmon because

we called for spill and flows; protective measures our tribes and agencies have been seeking for over a decade. (Attachment 6 - Scientific justification for spill).

This spring, Judge Marsh recognized that the current situation cries out for a major overhaul of the Columbia's hydro system to save the salmon. Using barges to protect salmon from their native environment, in lieu of dam modifications to provide suitable fish passage, has failed to halt the salmon's decline and offers no hope for their future. Restructuring the hydro system to meet the needs of salmon must be a priority for the region and the nation.

Salmon also need hatchery and production reform throughout the basin that assists natural stocks rather than replaces them. The Mitchell Act, though it was intended to mitigate for upriver losses, actually increased fishing pressure on upriver stocks by providing hatchery abundance in the lower river (Attachment 7 - Mitchell Act production table). Now mixed stock fisheries are tightly constrained by the condition of upriver stocks, and the Mitchell Act needs to be used in a manner that assists the weak stocks whose protection now restricts our fisheries.

Before this can happen, though, the National Marine Fisheries Service, as the lead agency for the Endangered Species Act, needs to recognize that its responsibility for recovery means more than maintaining a few isolated and fragmented upriver populations as museum pieces, the effect of the NMFS interpretation of the "distinct population" provision of the ESA. The Endangered Species Act seeks to rebuild listed populations in the habitat and it explicitly mentions "live trapping, propagation, and transplantation" as some of the means necessary to accomplish recovery. NMFS must heed the experience and advice of the Department of Interior on this issue and follow the law rather than the theoretical musings of a few of its employees. (Attachment 8 - Office of the Secretary of Interior letter). In this regard, I would like to offer two documents for the record; one a recent law review article written by Professor Dan Rohlf of Lewis and Clark Law School, an expert on the Endangered Species Act, who argues that the NMFS ESU policy violates the ESA. The other article entitled, "Managing Molecules . . ." contends that the ESU interpretation will severely limit biological recovery of listed species because it ignores fundamental salmon biology.

The Yakama, Warm Springs, Umatilla and Nez Perce Tribes are full parties to the federal court case of U.S. v. Oregon along with the States of Oregon, Washington, and Idaho, and the United States of America. The Columbia River Fish Management Plan, a court-ordered settlement agreement in the case, furnishes a blueprint for joint recovery efforts by the parties and provides a means for resolving disputes. Along with subbasin planning under the authorities of the Regional Act and the rebuilding

goals of the Pacific Salmon Treaty as well as the use of the best science available, the people of the Columbia Basin can have salmon recovery along with economic recovery for our salmon fishers, their suppliers, and our communities.

The Snake River Salmon Recovery Team recently submitted its final recommendations for a recovery plan for listed stocks of Snake River salmon to the National Marine Fisheries Service. Those recommendations will not lead to recovery. At the same time, the recommendations call for eliminating tribal fisheries, which have existed since time immemorial. The treaties signed by the tribes in 1855 guaranteed more. Our view of the final recommendations is aptly summarized in an excerpt from the Commission's letter to NMFS on the Team's draft, "[i]t is with both irony and anger that we note that the Team's draft recovery plan continues the failed policies of the past - even more draconian restrictions of treaty reserved fisheries with only minor changes required of those activities which destroy the vast majority of the remaining treaty resource." (Attachment 9 - Letter to Douglas Hall).

Currently, the Commission and its member tribes are completing a restoration plan for the Basin that provides a basin-wide, watershed-based approach to salmon recovery. The Commission recognizes the need for coordination among our governments if the plan is to succeed and will utilize the existing authorities in concert with the relevant state and federal governments to accomplish plan objectives. Your assistance in encouraging cooperation from the States of Oregon, Washington, and Idaho particularly in the rejuvenation of subbasin planning, consultation on fish production, and use of the processes of the Columbia River Fish Management Plan can further our joint efforts.

Abundance Based Criteria for Recognition of Damaged
Salmon Populations

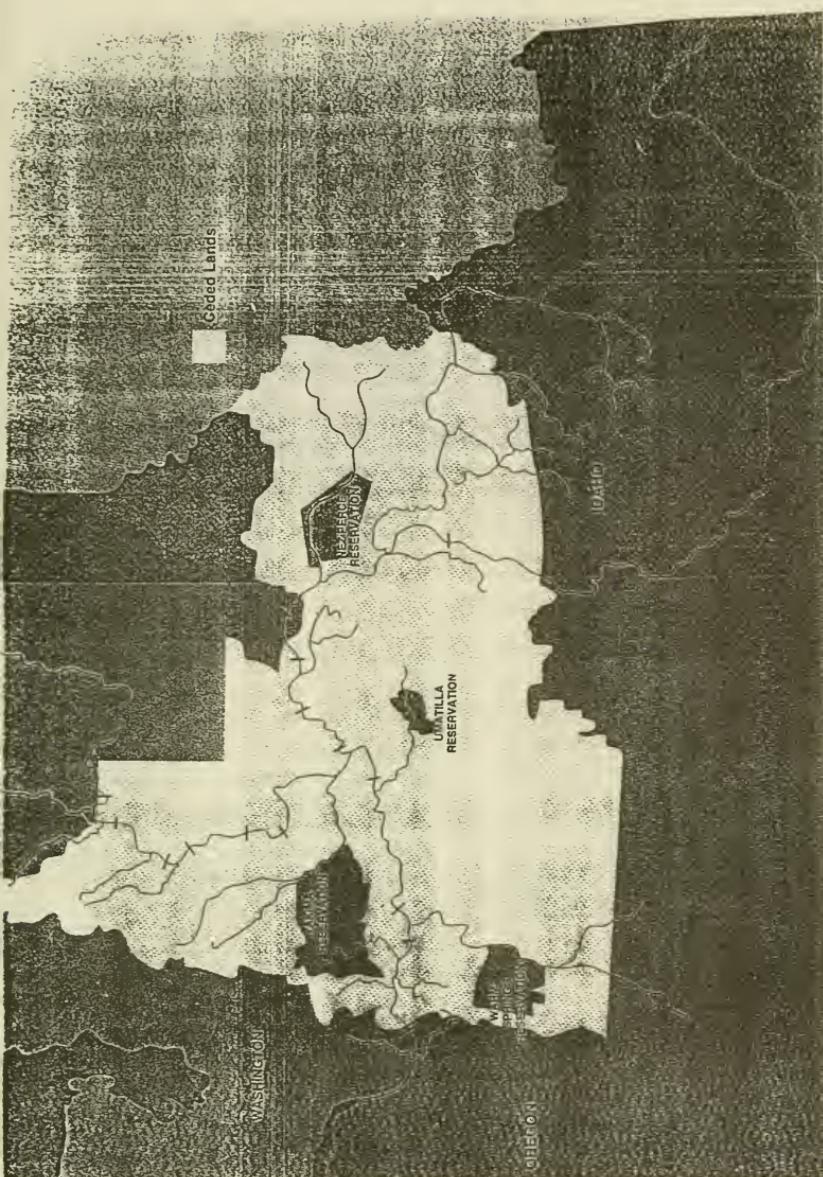
Prepared for the
Northwest Pacific Chinook and Coho Workshop, Boise, Idaho

Phillip R. Mundy and Jeffrey K. Fryer

September 29, 1992

Columbia River Inter-Tribal Fish Commission
729 N.E. Oregon, Suite 200
Portland, Oregon 97232

Attachment 2



Abstract

The question of how to measure the status of Columbia Basin salmon stocks is addressed by calculating several simple statistics for annual observations of chinook spawning escapement, primarily redd counts, from all available localities in that portion of the Columbia Basin within the states of Idaho, Oregon, and Washington. The records are an excerpt of the National Environmental Database (NED). The results for a total of 400 chinook salmon spawning escapement surveys (292 of wild, 67 of hatchery, and 41 of other origin) are reported. Less than 26% (103) of the most recent surveys were at seeding levels greater than 50%, with more than 30% (122) of those surveys being seeded at 10% or less. A total of 117 surveys (29%) were identified as badly damaged and decreasing. Among these surveys, 70% (82) were at or below the 20% seeding level. Among wild salmon surveys, more than half (53%; 155) were most recently at levels of annual abundance of no more than 20% of seeding. The forty-four wild chinook surveys identified as critically damaged were consistent with federal threatened species designations. Of the 67 hatchery observations, less than 24% (16) were most recently at, or below, 10% of their maxima during the time span of the surveys. Most of the chinook salmon survey areas in the Columbia Basin clearly are both in chronic decline and have critically low levels of spawning escapement.

Introduction

The question of how to measure the status of Columbia Basin salmon stocks has always been important, however the need to answer this question has taken on an air of urgency since stocks of chinook salmon in the Snake Basin joined the federal list of threatened species earlier this year. The federal listings, and the fact that salmon stocks in the Columbia Basin have been repeatedly declared to be at risk (i.e., NPPC 1986), add impetus to the discussion of appropriate measures of stock status.

The diversity of measurement techniques available in the form of visual counts at hydroelectric dams, and surveys of spawning activity made by foot and from the air, make the comparison of stock status for wild salmon populations problematic. Hatchery populations have counts of individuals returning to the facility that, in principle, are directly comparable. At present the need has not been met for a comprehensive survey of wild salmon populations that employs a quantitative measure of wild stock health and permits meaningful comparisons among stocks. The present effort is focused on chinook salmon, however the approach envisioned should be applicable to all species on which there are similar types of data.

Methods

The data are annual observations of at least four kinds, all measures of chinook spawning escapements; redd counts on natural spawning areas, both foot and aerial, dam and weir counts, and hatchery rack counts at all available localities in that portion of the Columbia Basin within the states of Idaho, Oregon, and Washington. The records were obtained from an excerpt of the National Environmental Database, NED, provided by Mr. Duane Anderson (NPPC, Northwest Power Planning Council, Portland, OR). The NED is coordinated by Mr. Tom Pansky (Bonneville Power Administration, Portland, OR).

Each locality was examined in order to eliminate those annual time series of less than twenty five years of continuous records. For each series retained, a fifteen-year moving average was calculated for each year as the arithmetic mean of the year and the fourteen preceding years, starting with the fifteenth year of data, and progressing to the latest year available, usually 1990. Working with the fifteen-year moving averages, the parameters of a linear regression were calculated for the annual time series of each locality, and those localities having negative slopes that tested significantly different ($\alpha = 0.05$) from zero were identified as, badly damaged and decreasing. Finally, the most-recent annual abundance observation, usually that of 1990, was taken as a percentage of the maximum annual observation in its time series in order to provide a rough measure of the most recent level of seeding of the spawning grounds. A spawning level that is 10% of the maximum observed is said to be at 10% of seeding. The ten percent level is arbitrarily defined as the threshold for being critically damaged.

Results

A total of 400 chinook salmon spawning escapement surveys (292 of wild, 67 of hatcheries, and 41 of others that include mixed hatchery and wild data such as dam and weir counts) were found to have time series long enough for this analysis. In examining the most recent survey abundance, less than 26% (103) of the surveys were greater than 50% of the historical maximum, with greater than 30% (122) being 10% or less than the historical maximum as of 1990 (Figure 1).

In examining the most recent value for the 292 surveys of wild salmon alone, about 24% (69) were greater than 50% of the historical maximum abundance, however in more than 36% (106) of the surveys, the most recent annual abundance was 10% or less of the historical maximum survey abundance (Figure 2). After editing the list of wild salmon surveys at or below the 10% seeding level to exclude observations about which the authors have unanswered questions, there remain 44 biologically well known survey sites that are most likely to be indicative of critically damaged salmon populations (Table 1). The 44 surveys identified as critically damaged (Table 1) are also noteworthy in that all of the surveys in Idaho, and most of the surveys in Oregon, as well as one in Washington, contain individuals of species listed as threatened under the federal Endangered Species Act. More than half of the wild surveys (53%; 155) were most recently at levels of annual abundance of no more than 20% of their maxima during the time span of the surveys.

Of the 67 hatchery observations, slightly less than 39% (26) had most recent annual abundances above 50% of their maxima during the time span of the surveys (Figure 3). Less than 24% (16) of these most recent annual abundances were at, or below, 10% of their maxima during the time span of the surveys.

In examining trends in abundance in the 400 annual time series, 117 (29%) had significantly negative slopes, and were found to have their most recent annual abundances below 50% of their maxima during the time span of the surveys (Figure 4). Among these badly damaged and decreasing chinook surveys, nearly half (47%; 55) were at or below 10% of their maxima during the time span of the surveys, and fully 70% (82) were at or below the 20% level.

Discussion

The nature and limitations of the study should be recognized. First of all, the time series of each locality is called a *survey*, not a population or stock (Simon and Larkin, 1972), because the authors presently have no basis to make this judgement. While the authors are optimistic that most of the surveys described as "wild chinook" and "hatchery chinook" will ultimately turn out to be indicators of self-sustaining breeding populations, or stocks, some may not. Questions of how to aggregate the individual groups of spawners described in these surveys (i.e., Table 1) into self-sustaining stocks have not been answered here, however such recommendations are the subject of much current research, including the authors. Secondly, the integrity of the survey data has been assumed without direct discussion with the agencies involved. The assumption of integrity means that the locality surveyed and the survey methods have remained the same throughout the time span of the surveys.

The statistical methods were chosen in the belief that annual observations within a locality were comparable from year to year. Further, while differences in the type of data among localities make comparisons among localities difficult or impossible, the methods permit the slopes of regressions to be compared. Surveys reporting in units of redd counts do not produce measures of abundance that are necessarily proportional to total population size in the drainage basin, since the standard reach probably contains an inconstant portion of the total spawning population each year. However, if the same reach is counted each year, then the annual redd counts do accurately reflect the population of that reach, and that reach alone. Since the standard index reaches are usually the best spawning grounds accessible to the surveyors, trends in redd counts should be excellent measures of the status of wild chinook populations in general. So, while it is recognized that the combined redd count data are not necessarily proportional to total chinook abundance in the Columbia River Basin as a whole, the redd counts are considered by the authors to be directly proportional to chinook spawning abundance in the reaches surveyed.

It is recognized that escapement data may not fully reflect fluctuations in total population size because of unaccounted removals by fisheries, and other sources of human-induced mortality (see Symons and Walidchuk 1984; Schwartzberg and Roger 1986). From the standpoint of measuring stock status of very small chinook populations, the authors view this as an academic concern. The purpose of this effort is to identify simple measures that may be related to stock status, and to inform on the status of these measures by species and locality, not to identify the causes of population declines. If numbers of spawners sufficient to sustain the populations are not being recruited annually, in the end it makes very little difference why the populations have disappeared. The authors hope that this type of work can help to point out where

salmon recovery actions that will address the causes of population decline are most needed.

The criteria for classifying the status of chinook populations in the surveys were chosen to be as simple as possible. A fundamental requirement was that the criteria be abundance based, so that a measure proportional to annual egg deposition could be examined. The criteria should persist in time. Fifteen years was selected as the period for the moving average to correspond to three generation lengths for the average chinook population. It was felt that processes that were sustained over three generations could be viewed as firmly established, and significant, in any salmon population (see Cuenco et al., in press). The moving average used in this application is not sensitive to short term fluctuations in abundance. A measure of carrying capacity was seen as essential to determining the status of stocks through time. Since only a very crude measure was necessary, it was assumed that the peak annual survey count would be a minimum estimate of the historical carrying capacity of the survey site. Environmental degradation continually erodes carrying capacity at most of the survey localities, hence current capacity at any given locality may be very much lower than that of the last century. A threshold level for determining critical status is also an important measure of stock status. As an arbitrary rule, the authors chose seeding levels below 50% as a necessary condition indicative of a failing stock. Bear in mind that this is a screening technique designed to point out potential, not necessarily actual, problems. While it is recognized that a healthy salmon stock may frequently fall below 50% of full seeding, the authors believe that falling below 50% of seeding in the presence of a long-term, steady decline warrants a careful examination of stock status.

Finally, the criteria of stock status need to distinguish populations that are truly at risk of extirpation from populations undergoing normal fluctuations in abundance. The measure of the strength of the linear trend apparent in the annual time series of the fifteen-year moving average appears to be adequate to identify damaged populations, and it gives error bounds for the parameter estimates that permit comparisons among localities. The combination of a significant downward trend with less than 50% of seeding in the most recently observed annual abundance pose very compelling indications that a population could be badly damaged and decreasing.

In future research we plan to add the most recent value of the fifteen-year moving average as a percentage of the maximum observed abundance to the list of criteria indicative of a damaged salmon population. A seeding level below 50%, when based on the most recent fifteen-year average, may be sufficient to identify a chronically depressed group of spawners without additional analysis of this kind of data. When based on only the most recent observation of abundance (e.g. Figs. 1 - 4, and Table 1), a seeding

level below 50% needs to be combined with a significantly negative slope in the regression of average abundance on time to identify chronic damage.

Most of the chinook salmon escapement survey areas in the Columbia Basin clearly are both in chronic decline and have critically low levels of spawners. It is our inference that many of the chinook populations represented by the survey areas are in chronic decline. More than a quarter of the surveys are in the badly damaged and decreasing category (see Figure 4), while only slightly more than a quarter of all surveyed localities are above 50% seeding, regardless of trends in abundance (see Figure 1). Among the 117 badly damaged survey localities, most (82) are at, or below, 20% of seeding, the last time they were checked. Assuming that these surveys may represent chinook salmon populations, there are 82 chinook salmon populations in the Columbia Basin that have been steadily declining for the past three generations, and that have managed to achieve spawning levels of only one-fifth of the carrying capacity during the most recent spawning. If these surveys represent populations, or portions of populations, then they would clearly be candidates for accelerated recovery actions (see CBFWA 1991).

Literature Cited

CBFWA (Columbia Basin Fish and Wildlife Authority) 1991. Integrated System Plan for Salmon and Steelhead Production in the Columbia River Basin. June 1, 1991. CBFWA, Portland.

Cuenco, M., T.W.H. Backman, and P.R. Mundy (in press). The use of supplementation to aid in natural stock restoration. In J.G. Cloud (ed.) *Genetic Conservation of Salmonid Fishes*. Plenum Publishing Corporation, New York.

NPPC (Northwest Power Planning Council) 1986. Compilation of information on salmon and steelhead losses in the Columbia River Basin. (pp. 199-222). March 1986. Northwest Power Planning Council, Portland.

Schwartzberg, M., and P.B. Roger. 1986. An annotated compendium of spawning ground surveys in the Columbia River Basin above Bonneville Dam. Columbia River Inter-Tribal Fish Commission Technical Report Number 86-1, Portland.

Simon, R.D. and P.A. Larkin (eds.). 1972. The stock concept in Pacific salmon. H.R. MacMillan Lecture Series, University of British Columbia, Vancouver, Canada.

Symons, P.E.K., and M. Waldichuk (Editors). 1984. Proceedings of the Workshop on Stream Indexing for Salmon Escapement Estimation, West Vancouver, B.C., 2 - 3 February 1984. Canadian Technical Report of Fisheries and Aquatic Sciences. No. 1326, 258p.

Table 1. A list of the locations of chinook abundance survey areas that are most likely to contain critically damaged chinook salmon populations in the Columbia River Basin of Idaho, Oregon and Washington States.

Figure 2. Frequency histogram of Columbia Basin chinook spawning escapement surveys of wild spawners at seeding levels grouped in ten percent increments.

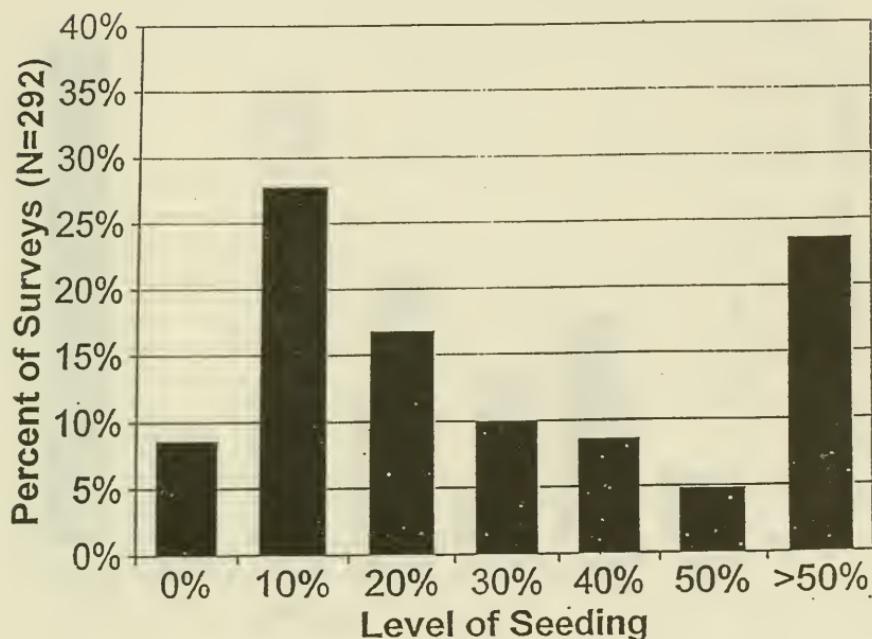


Figure 3. Frequency histogram of Columbia Basin chinook spawning escapement surveys of hatcheries returns at seeding levels grouped in ten percent increments.

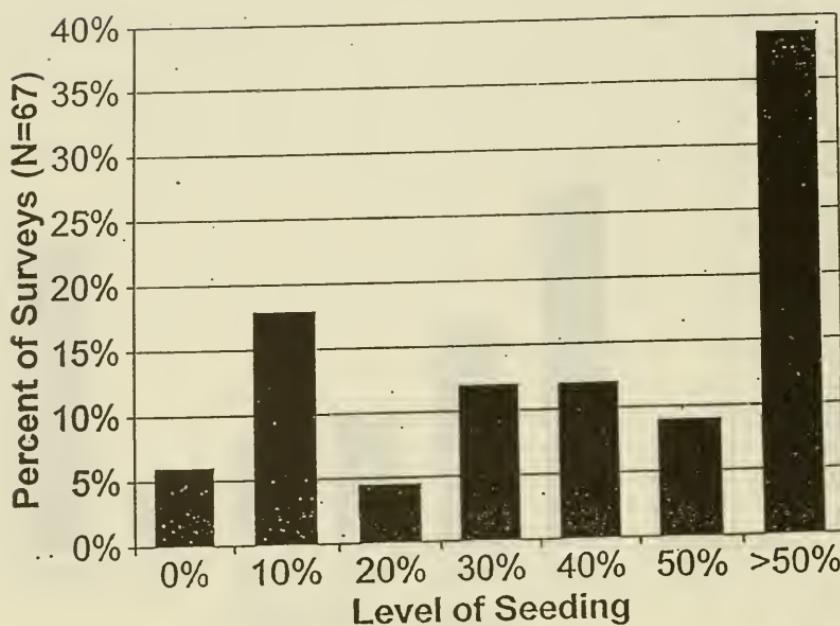
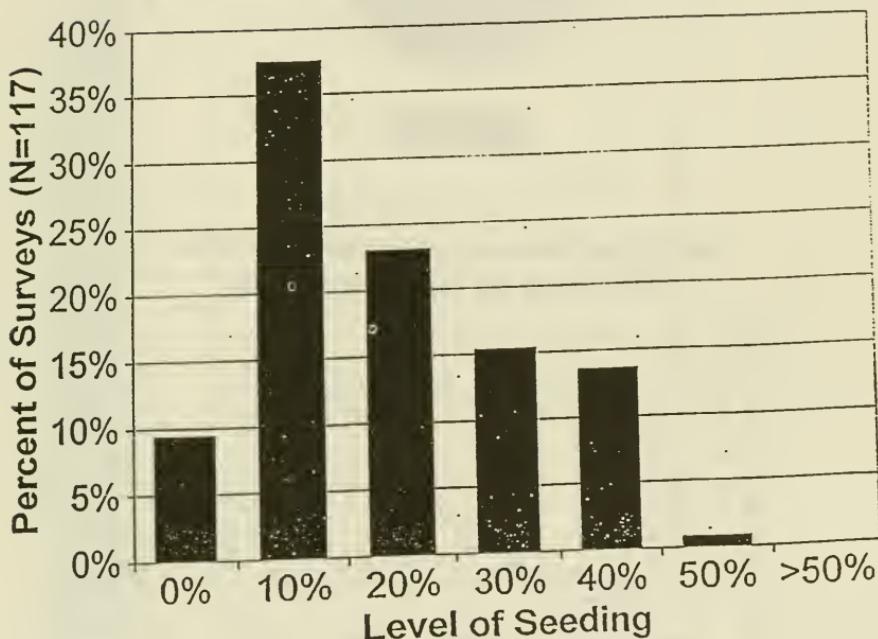
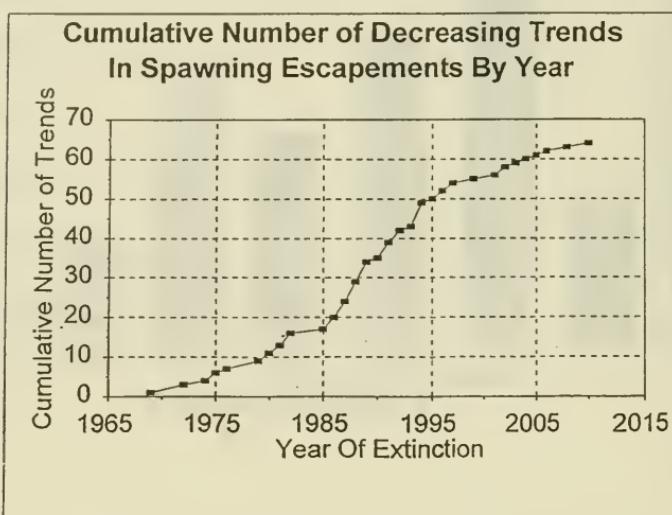
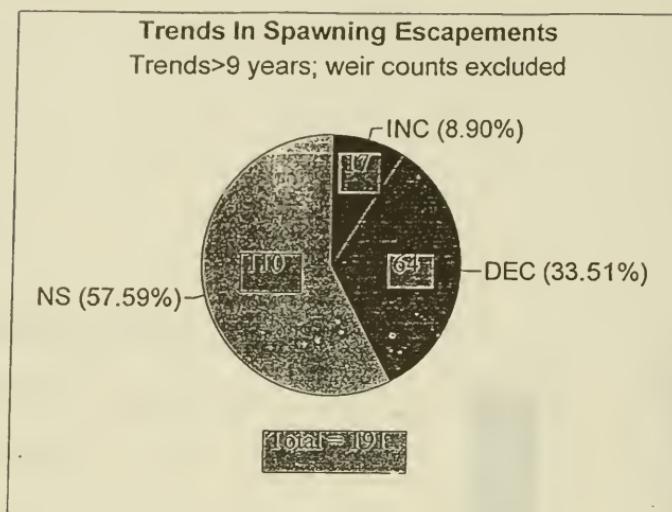


Figure 4. Frequency histogram of Columbia Basin chinook spawning escapement for those surveys classified as badly damaged and decreasing at seeding levels grouped in ten percent increments.



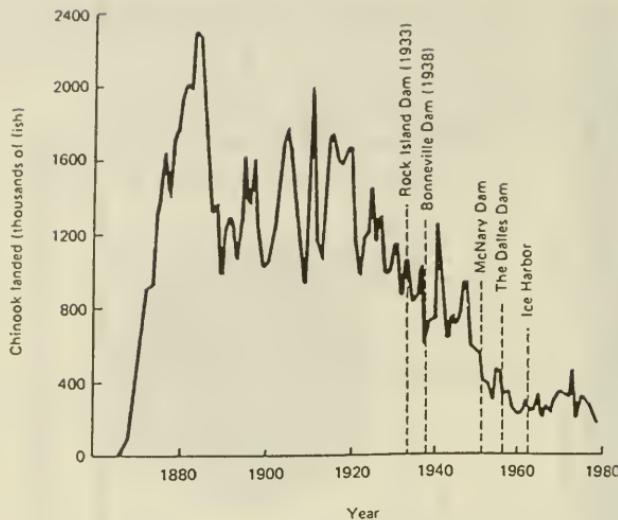
Trends in spawning escapement indices of Pacific salmon in the Columbia River basin above Bonneville dam during the period of 1945 to 1990.



Salmon and Steelhead Returns to the Umatilla River Basin

Year	Spring Chinook	Rain Chinook (URB)	Coho	Summer Steelhead	Total
Pre-1920's	Thousands	Thousands	Thousands	Thousands	Thousands (all species)
1920's -1984	0	0	0	Few Thousands	Few Thousands (STS only)
1985	0	85	0	3264	3349
1986	0	435	0	2923	3358
1987	0	186	29	3554	3769
1988	13	257	1683	2782	4735
1989	164	619	4681	2474	7938
1990	2190	564	935	1667	5336
1991	1330	1006	2057	1111	5309
1992	464	304	529	2769	4066
1993	1221	412	1549	1913	5095

Note: -Subjacks not included
 -The few salmon seen between the 1920's and 1984 are assumed to be strays (functionally zero)



Landing of chinook salmon by the Columbia River commercial fishery, 1866 to 1979 (from Chapman et al. 1982).

SCIENTIFIC RATIONALE FOR IMPLEMENTING A SPILL PROGRAM TO
INCREASE JUVENILE SALMON SURVIVAL IN THE SNAKE AND
COLUMBIA RIVERS

The following summarizes the scientific basis for implementing a spill program during 12 nighttime hours at all Corps of Engineers dams on the mainstem Snake and Columbia Rivers to increase protection for 1994 spring outmigrating juvenile salmon. As concluded by the peer review team of independent scientists, "[t]ransportation alone, as presently conceived and implemented, is unlikely to halt or prevent the continued decline and extirpation of listed species of salmon in the Snake River Basin" (Mundy et al. 1994). Spill at transportation and collector dams, while continuing to transport those fish collected by the mechanical bypass system, addresses the substantial uncertainty associated with the effectiveness of the juvenile transportation program (TRG 1993; Mundy et al. 1994). A management approach when faced with uncertainty is to spread the risk between two choices. The spill program is designed to improve in-river passage survival and spread the risk by leaving a larger percentage of juvenile salmon migrating in-river. For the last several years, substantial spill for juvenile migrants has been implemented at all mid-Columbia Public Utility District projects. As well, substantial controlled spill has been routinely implemented at Corps projects including Lower Monumental, Ice Harbor, The Dalles, and Bonneville Dams as an effective management strategy to increase juvenile salmon survival.

The objective of the spill program is to safely guide 80% of the juvenile migrant salmon away from the turbines, the most harmful passage route at the dams, and pass them through mechanical bypass systems and over the spillways. Spill volumes will be controlled to avoid harmful levels of dissolved atmospheric gas in the river.

The current spill program at the mainstem Corps dams was jointly coordinated and devised by fishery scientists from the National Marine Fisheries Service, the United States Fish and Wildlife Service, the Oregon Department of Fish and Wildlife, the Washington Department of Fish and Wildlife, the Idaho Department of Fish and Game, and the Columbia River Inter-Tribal Fish Commission. The spill program has been adopted for the remainder of the 1994 spring outmigration. This may be one of the major options, evaluated in the long term as part of an adaptive management approach, used to assist in improving juvenile survival with respect to recovery.

Fishery agencies and tribes have chosen a conservative approach to the implementation of the spill program. Where possible, based on real time and historical salmon migration patterns, spill is generally being confined to nighttime hours. This substantially limits economical impacts of spill because power demand is much less at night and river flows are lowered at night. An extensive program for monitoring the signs of gas supersaturation impacts in both juvenile and adult salmon has been established with trained biologists at each dam. The spill program can be immediately modified based upon the daily results of the monitoring program.

The following points further describe in detail the scientific rationale for initiating and continuing the program:

- * Controlled spill as provided by the program, with the stringent monitoring protocols included, provides the best possible means of passage survival for downstream salmon migrants. Extensive studies at mainstem dams throughout the basin document that juvenile mortality from spill ranges from 0-3% (NWPPC 1986; Raymond 1988; Holmes 1952; Ledgerwood 1990; Iwamoto et al. 1993).
- * Other passage routes through dams cause higher levels of mortality. Turbine passage causes from 10-20% direct mortality (NWPPC 1986; DFOP 1993). Mechanical bypass systems, not installed at all dams, only guide and collect 35-70% of juvenile migrants. Mortality to juvenile spring chinook that are guided by mechanical bypass systems ranges from 1-3% (Monk et al. 1991; Dawley 1991; FTOT annual reports; Krema et al. 1986; and Brege et al. 1987).
- * Spill disperses predators from the forebay and tailrace areas (Faler et al. 1988)
- * There is considerable evidence that juvenile fish can detect and avoid high levels of gas supersaturation (Dawley et al. 1975).
- * After installation of the spill deflectors in the mid 1970's, the historical record demonstrates that better adult returns followed from juveniles which migrated under high flow and high spill conditions (Fish Passage Center SOR-19 1994).
- * Four of the five best adult return ratios for Snake River spring and summer spring chinook from 1974 to 1989 occurred in 1975, 1982, 1983, and 1984. Spill levels during these years were substantially higher than those currently being implemented.
- * When compared to past years, the levels of spill being implemented in 1994 are substantially less than what occurred in the late 1970's and early 1980's. These levels are not, "unprecedented" as described by the federal operators.
- * Levels of spill proposed for 1994 are considerably less than those that occurred in 1993, a year in which runoff levels late in the spring chinook migration resulted in high spill rates. In 1993, no fish with signs of impacts of gas supersaturation were detected through the Smolt Monitoring Program until spill levels greatly exceeded those proposed for 1994. The monitoring program showed that in spite of high spill (which occurred during flows that were more than twice the levels anticipated for 1994) the observed impacts of dissolved gas on fish were minor (DFOP 1993, Appendix 6).

Prepared by the staffs of: National Marine Fisheries Service, United States Fish and Wildlife Service, Columbia River Inter-Tribal Fish Commission, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, and the Washington Department of Fish and Wildlife

References

Brege, D. A., D. R. Miller and R. D. Ledgerwood. 1987. Evaluation of the rehabilitated juvenile salmonid collection and passage system at John Day Dam - 1986. Contract to Army Corp of Engineers, Portland District. By the Coastal Zone and Estuarine Services Division, Northwest Fisheries Center, National Marine Fisheries Service, Seattle, Washington.

Detailed Fishery Operating Plan (DFOP) with 1994 Operating Criteria. 1993. 44 pages and appendices. Columbia Basin Indian Tribes and the State and Federal Fish and Wildlife Agencies

Dawley, E., R.D. Ledgerwood, L.G. Gilbreath, P.J. Bentely, and M.H. Schiwe. 1991. Direct assessment of mortality, injury and stress among juvenile salmonids using the bypass system at Bonneville Dam second power house. Progress report October to December 1990. Contract E96910013 to the United States Army Corp of Engineers, Portland District. By the Coastal Zone and Estuarine Services Division, Northwest Fisheries Center, National Marine Fisheries Service, Seattle, Washington.

Dawley, E., T. Blahm, G. Snyder, and W. Ebel. 1975. Studies on effects of supersaturation of dissolved gases. NMFS Seattle, WA.

Faler, et al. 1988. Effects of variation in flow on distributions of northern squawfish in the Columbia River below McNary Dam. North American Journal of Fisheries Management. Volume 8. 30-35.

Fish Passage Center. 1994. Fish Passage Center System Operational Request to the Federal Executive In-Season Management Team on April 26, 1994. Enhancement of 1994 spring migration conditions. Request number 94-19.

FTOT (Fish Transportation Oversight Team) Reports (annually since 1981). Annual work plan for transport operations.

Holmes, H. B. 1952. Loss of salmon fingerlings in passing Bonneville Dam as determined by marking experiments. Unpublished manuscript. United States Fish and Wildlife Service. 62 pages.

Iwamoto, Robert N. et al. 1993. Survival estimates for the passage of juvenile chinook salmon through Snake River dams and reservoirs, 1993. Annual Report to Bonneville Power Administration. Coastal Zone & Estuarine Studies Division, Northwest Marine Science Center, National Marine Fisheries Service, Seattle, WA. Draft Report. 140 pages.

Krema, R. F. , D. A. Brege and R. Ledgerwood. 1986. Evaluation of the rehabilitated juvenile salmonid collection and passage system at John Day Dam - 1985. Contract to Army Corp of Engineers, Portland District. By the Coastal Zone and Estuarine Services Division, Northwest Fisheries Center, National Marine Fisheries Service, Seattle, Washington.

Ledgerwood, R. D. et al. 1990. Relative survival of subyearling chinook which have passed Bonneville Dam via the spillway or the Second Powerhouse turbines or bypass system in 1989, with comparisons to 1987 and 1988.

Monk, B. H., B. J. Sandford, and J. G. Williams. 1991. Evaluation of the juvenile fish collection, and bypass facility at Little Goose Dam, 1990. Annual Report of Research. Project E86900057 to the United States Army Corps of Engineers, Walla Walla District. By Coastal Zone & Estuarine Studies Division, Northwest Marine Science Center, National Marine Fisheries Service, Seattle, WA.

Mundy, Phillip R. Ph.D. et al. 1994. Juvenile Salmonid Transportation from Hydroelectric Projects in the Columbia River Basin, An Independent Peer Review, Draft Final Report to United States Fish and Wildlife Service, Portland, Or. 151 pages and appendices.

Northwest Power Planning Council. 1986. Compilation of information on salmon and steelhead losses in the Columbia River Basin. 252 pages and appendices.

Raymond, H.L. 1988. Effects of hydroelectric development and fisheries enhancement on spring and summer chinook salmon and steelhead in the Columbia River basin. North American Journal of Fisheries Management. Volume 8. Pages 1-24.

TRG Ad Hoc Transportation Review Group. 1992. Review of salmon and steelhead transportation studies in the Columbia and Snake rivers, 1984 to 1989. Report submitted to the Columbia Basin Fish and Wildlife Authority. 40 pages.

MITCHELL ACT RELEASE PROGRAMS

1991

137

	<u>ABOVE THE DALLES DAM</u>	<u>BELLOW THE DALLES DAM</u>
SPRING CHINOOK	1,387,000	7,137,000
SUMMER CHINOOK	0	0
FALL CHINOOK	1,891,000	85,633,000
 Tules	 0	 66,595,000
Bright s	1,891,000	18,252,000
Rogue R.	0	786,000
 COHO	 1,446,000	 21,619,000
SOCKEYE	0	0
STEELHEAD	180,000	2,626,000
CUTTHROAT	0	145,000
 TOTAL	 4,904,000	 117,160,000

Attachment 7



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

JUN 30 1993

In Reply Refer To:
FR 91\305

Director, Office of Protected Resources
National Marine Fisheries Service
1335 East-West Highway
Silver Spring, Maryland 20910

Dear Sir/Madam:

The Department of the Interior (DOI) has reviewed the Interim Policy on Artificial Propagation of Pacific Salmon (Policy) Under the Endangered Species Act (ESA), published in the Federal Register on April 5, 1993. We offer these comments as an initial response to the published Policy.

The National Marine Fisheries Service's (NMFS) Interim Policy is a major step in addressing the potential risks of artificial propagation. However, the focus on risks may miss some of the potential benefits of allowing listed species to be incorporated into an artificial propagation program to facilitate salmon recovery efforts. For instance, artificial propagation efforts that preserve the gene pool and population structure of the listed stocks may play an important role in the short-term.

The Policy was developed as internal guidance for NMFS to evaluate artificial propagation in the listing, consultation, permitting, and recovery of Pacific salmon under the ESA. In practice, however, the Policy could have far-reaching implications for all involved jurisdictions regarding the use of artificial propagation for restoration of most West Coast salmon. Policy implementation may require major modifications in many artificial propagation programs conducted by Federal, State, Tribal, and other entities, which over the past 60 years, have mitigated for impacts of development activities and restored depleted stocks. Likewise, the precedents established by this Policy could affect artificial propagation of other fish throughout the Nation listed under the ESA.

The Policy should be revised and further coordinated with other agencies and affected parties before it is applied. Consequently, we recommend that its implementation be deferred for a short period. To that end, DOI is prepared to actively participate in an effort to resolve issues and to pursue

answers to specific questions. The NMFS should schedule a meeting of all affected parties as soon as possible to provide a forum to discuss the implications of the Policy and to resolve problems identified.

In our view, the NMFS Policy affects many DOI salmon propagation and restoration programs on the West Coast. The DOI has several broad concerns over the implications the Policy has for these programs. These general concerns summarized below more appropriately should be subject to an interagency discussion. The Enclosure provides more detailed comments about the Policy, and identifies implications that go beyond Pacific salmon.

Recovery of listed species should be approached from an ecosystem perspective, allowing flexibility in artificial production in case measures to address habitat, hydropower, and harvest impacts do not work as planned. By focusing narrowly on hatchery issues, to the neglect of habitat, harvest, and hydropower impacts, the Policy might be viewed as another step in a piecemeal approach to the consultation process. Earlier this year Judge Marsh dismissed a Sierra Club lawsuit that challenged the adequacy of the consultation process under the ESA, largely because of the Federal Government's commitment to take a comprehensive approach in future consultations.

More than 30 Tribal governments have trust, treaty, and other interests in Pacific salmon. The four Columbia River treaty fishing Tribes have established a continuing dialogue with NMFS relative to recovery planning. The 20 Boldt Case Area Tribes conduct artificial propagation operations at approximately 50 fish hatcheries and rearing facilities, and release 40-50 million salmon and steel head into western Washington waters annually. These hatcheries serve a variety of purposes including mitigation for lost production due to habitat loss, enhancement of depressed stocks, and augmentation of fisheries in helping to meet Indian treaty rights. Releases from Tribal hatcheries benefit commercial and sport fisheries in the United States and Canada, and returning spawners help satisfy Tribal economic, subsistence and ceremonial needs. These Tribes generally believe the draft policy reflects a negative bias towards artificial production, and are concerned about the complex harvest sharing arrangements under the United States/Canada Pacific Salmon Treaty, and on associated future run strengths and treaty harvest opportunities.

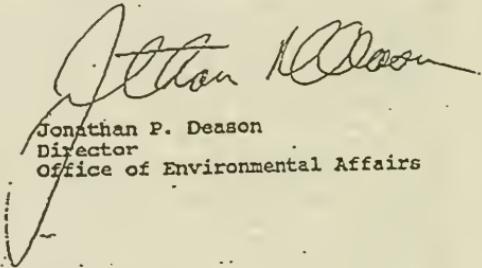
In view of the Federal Government's trust responsibilities, self-determination policies and government-to-government relationship with Indian Tribes, and in consideration of Tribal roles and responsibilities as co-managers of the Pacific salmon resource, and the potential impacts of artificial propagation policy on the future exercise of Indian rights, we believe it is critical that the views of Tribal governments be factored into the rulemaking process. This is especially important since some Tribes, not

members of the two umbrella groups, have differing views and interests. It is the duty of all Federal agencies to ensure that their decisions and actions fully take into account impacts on Indian fishing rights.

In conclusion, the DOI acknowledges the need for appropriate policy on artificial propagation of Pacific salmon and believes the Interim Policy promulgated by NMFS is a beginning. However, there are substantial concerns about the Policy as well as its broader implications to artificial propagation of other fish nationwide and to DOI's Fish and Wildlife Service (FWS) implementation of the ESA that necessitates prompt revision of the Interim Policy. Hence, we recommend that NMFS formally defer implementation of the Policy for several months during which time DOI, working with Tribal and State fisheries managers on the West Coast, will work with NMFS to revise the Policy. An opportunity should then be provided for all affected to review the revised Policy before it is finalized.

We look forward to working with you to seek an appropriate resolution of the important issues raised by the Policy and these comments. Any questions should be directed to Ken Havran, Office of Environmental Affairs, (202) 208-7116.

Sincerely,



Jonathan P. Deason
Director
Office of Environmental Affairs

Enclosure

Enclosure

Specific Comments about the Policy

In considering recovery options for a listed species, an objective assessment of artificial production should include benefits as well as uncertainties and potential risks. The NMFS should clarify the statement reading: "Whether for recovery, fishery production or other mitigation purposes, artificial propagation must minimize the potential for deleterious effects on both listed and unlisted species if it is to be consistent with the conservation of genetic and ecological diversity in Pacific Salmon." As included in the Interim Policy, that statement is subject to interpretation and may not be specific enough to implement.

With reference to the background section, the narrative includes some statements that are debatable and/or misleading. The NMFS should adopt a more balanced perspective. Benefits are created and risks are taken when a listed species is incorporated into an artificial production program to facilitate its recovery. The potential benefits created include: 1) more individuals produced in a shorter time thereby potentially increasing the viability of the species, 2) conservation of genetic resources by avoidance of extirpation when there is insufficient habitat for the species to complete its life cycle, 3) increased genetic diversity and average fitness through controlled breeding, and 4) increased knowledge of the biology of the species that can be applied in recovery actions.

The potential risks incurred include: 1) broodstock removals may further diminish the viability of naturally spawning populations; 2) mechanical failures, human error, and disease may kill some or all of the animals in the artificial production facility; 3) inbreeding depression may decrease the fitness of the animals in the program, thereby decreasing the viability of the species; and 4) in captive broodstock programs, the complete lack of natural selection at all life history stages could result in genetic change in the captive population relative to its natural ancestors, and such changes may reduce the ability of the population as a whole to survive and reproduce in the wild.

Further, benefits are created and risks are taken when artificially propagated non-listed salmon species are released into waters containing listed salmon species. The potential benefits created include: 1) protection of listed species in mixed stock quota fisheries, and 2) partial protection of listed species from predation. Artificial propagation of non-listed salmon species may also pose a variety of ecological risks to

listed salmon populations. These potential risks include increased competition and predation, displacement of natural fish, altered migratory and spawning behavior, and disease transfer. For example, the release of large numbers of hatchery fish can elevate levels of competition for food, habitat or mates, and may lead to displacement of natural fish from their habitat.

To minimize the risks of artificial propagation, NMFS should consider jointly developing minimum standards for hatchery operations that meet the objectives of the Policy and use the best hatchery technologies available to reduce artificial selection of genetic traits. Moreover, NMFS should clarify the role of captive broodstock programs in the preservation of endangered and threatened fish stocks and should establish a protocol with critical thresholds for taking any actions to collect and maintain a captive broodstock.

We are still very concerned about how NMFS intends to implement its definition of a "species" as an "evolutionarily significant unit" (ESU). There is considerable professional debate on the West Coast concerning the number and significance of salmon ESU's and the role of hatchery stocks in salmon enhancement and restoration. The second part of the definition reflecting the contribution to the biological species' evolutionary legacy is nebulous and subjective. In practice, this concept cannot be measured. The DOI has not been supportive of the concept in earlier discussions.

The document would be enhanced by inclusion of citations to relevant studies supporting the assertions on which the Policy is based. This is also important because the ESA requires that the best scientific information available be used as the basis for resolving the issues this Policy addresses. On page 17574, the reference in column 3 should indicate that the Snake River sockeye salmon are listed as endangered rather than threatened.

The first tenet in the policy statement section of the Policy (page 17574, column 3) establishes a three step decision process for deciding whether to list artificially propagated Pacific salmon. The first step involves identifying stocks at risk as the basis for listing and other actions under the ESA. The second step is to decide whether artificially propagated fish are part of that stock. Decisions under this second step are to be based on three criteria specified in the first paragraph, column 1, page 17575.

The first two criteria are appropriate. However, the third criterion dealing with uncertainty about the relationship between artificially propagated fish and the natural population is inappropriate. Under such uncertainty, the ESA requires that a conservative scientific approach be adopted that provides the "benefit of the doubt" to the affected species. To be consistent with how captive propagation is treated under the ESA, the third criterion should be deleted.

The last step involves deciding whether to include the artificially propagated fish as part of the stock when listing it under the ESA. When a stock is listed, artificially propagated fish from that stock would be protected under the ESA. Treating as not listed a portion of a stock that is indistinguishable from a listed stock is arbitrary and has significant implications for other listed species. In addition, we do not agree with the position in the Policy that decisions to exclude broodstock as members of listed stocks should be based solely on a determination some time after the listing decision that those populations are not "judged essential for recovery."

Under the third tenet, the Policy allows for the propagation of "a very few generations." The genetic effects of hatchery selection could be substantially minimized if artificial propagation were limited to no more than one generation. However, we recognize that it may be necessary to continue propagation for longer periods where habitat constraints are severe. More specific guidance concerning when recovery of a species has occurred would be useful. In addition, retention time of hatchery-reared salmon should be as short as practical to ensure achievement of restoration goals.

The Policy also states that safeguards to protect fish from mortality and catastrophic loss during artificial propagation should receive high priority. Such safeguards should be required.

The fourth tenet of the policy statement section requires systematic monitoring and evaluation to determine when artificial propagation is no longer essential for recovery and should be terminated. We concur in this general approach to a finite application of stocking in a recovery strategy. In applying this tenet, however, it is important to recognize that stocking of artificially propagated fish may continue for years, if not decades.

In addition, several factors (e.g. the realities of commercial, sport, or Tribal exploitation especially of small populations, limitations on managing a fishery once a population is delisted, and year class weaknesses) may require some captive propagation beyond the initial recovery of a population.

Substantial elaboration of the parenthetical reference to directed take in the fifth tenet of the policy statement section is necessary to ensure effective recovery efforts. This would also minimize disruption of artificial propagation activities in support of other fishery responsibilities. The FWS's experience supports the experimental use of supplementation or outplanting as a potentially effective fishery resource restoration technique. However, it is not perfected so a fall-back strategy would be essential to ensure perpetuation of the stocks involved until sufficient natural production is re-established. Maintaining returns directly to fish hatcheries would be required, at least on an interim basis, to guarantee a source of broodstock for sustaining the genetic integrity of the stocks involved. Also, recovery would be accelerated and the fulfillment of compatible fishery responsibilities would be facilitated. This requirement to intentionally take listed fish at hatcheries or other facilities for broodstock should be explicitly authorized in the Policy. Since the principle focus is on the use of artificial propagation for recovery, addressing this issue under the third tenet may be more appropriate.

Also, under the fifth tenet, the Policy indicates that stock transfer of unlisted species should be "avoided." Stock transfers may need to be prohibited unless there is a clear determination that there will be no impacts to listed or "at risk" species.

Implications beyond Pacific Salmon

We are concerned about the broader implications of the ESU and the definition of "species" under the ESA applied to Pacific salmon in the Policy. The FWS has yet to finalize its policy on the definition of species (i.e., vertebrate populations). Hence, it is unclear whether the NMFS definition of species will be consistent with the FWS definition. The two agencies need to coordinate finalizing definitions that are, if not identical, at least compatible, prior to implementation of the Policy.

If extended beyond Pacific salmon, the concepts and principles embodied in the Policy could establish precedents for captive propagation programs for fish other than Pacific salmon under the ESA and for other purposes. Currently FWS propagates several species of sturgeon and desert fishes that are listed as well as Atlantic salmon. Major problems would be encountered in applying this Policy to these species since very few natural populations exist and they tend to involve small numbers of individuals.



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
729 N.E. Oregon, Suite 200, Portland, Oregon 97232

Telephone (503) 238-0667
Fax (503) 235-4228

December 16, 1993

Mr. Douglas K. Hall
Assistant Secretary for Oceans and Atmosphere
National Oceanic and Atmospheric Administration
Herbert Clark Hoover Building, Room 5804
14th Street and Constitution Avenue, N.W.
Washington, D.C. 20230

RE: Draft Snake River Salmon Recovery Plan. Recommendations prepared by Snake River Salmon Recovery Team

Dear Mr. Hall:

The Columbia River Inter-Tribal Fish Commission recently submitted peer review comments (attached) on the Draft Snake River Salmon Recovery Plan Recommendations prepared by the Snake River Salmon Recovery Team. The listed salmon are among those fish destined to pass the Commission's member tribes' usual and accustomed fishing places.

Since many of the recovery recommendations presented in the Team's Draft Plan are not of a scientific nature, but are of a policy and legal nature, the four Columbia River treaty tribes who govern the Columbia River Inter-Tribal Fish Commission have directed me to write this letter to you regarding some serious concerns arising from the Recovery Team's recommendations. Please refer to the attached technical peer review comments to better understand the technical basis of our concerns.

Our review found the Team's recommendations scientifically flawed, contradictory to the requirements of the ESA and the needs of the resource, and ignorant of well established legal principles regarding the tribes' treaty rights. If NMFS adopts the Draft Plan's recommendations, NMFS will fail in its federal trust and fiduciary responsibility to the tribes. The following discussion highlights our major concerns with the Team's draft recovery recommendations.

Attachment 9

The Draft Plan's recommendations are not consistent with the Columbia River Fish Management Plan (CRFMP), nor with the legal principles established by the federal courts that protect the tribes' treaty-secured fishing rights.

Review of the Team's Draft Plan indicates that the Team fundamentally misunderstands the CRFMP and the tribes' treaty rights. The Team failed to recognize that the word "conservation" is a legal term of art which has specific meaning and usage in the context of treaty fishing rights case law, but has a different definition in the Endangered Species Act. These two definitions are not interchangeable. As a result of these misconceptions, the Team made recommendations which would have adverse consequences to tribal, state, and federal co-management efforts.

The CRFMP was developed by the parties to United States v. Oregon and adopted as an order of the Federal District Court for the District of Oregon in October 1988. Parties to the CRFMP include the United States of America (represented by the Department of Interior's Assistant Secretary of Fish, Wildlife and Parks and Assistant Secretary of Indian Affairs; and the Department of Commerce's Undersecretary for Oceans and Atmosphere), the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes and Bands of the Yakima Indian Nation, the States of Oregon, Washington, and Idaho, and the Shoshone-Bannock Tribe (subject to certain limitations).

Among its purposes, the CRFMP is intended to "protect, manage and enhance the fishery resources of the Columbia River system for the mutual benefit of present and future generations" consistent with the treaty rights and conservation requirements set forth by numerous federal court decisions such as United States v. Oregon, United States v. Washington and Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n.

The harvest provisions in the CRFMP were developed to assist in rebuilding Columbia River salmon runs, based on estimates of fish production and limits to productivity at the time the Plan was developed. The parties to United States v. Oregon recognized that it would be very difficult to achieve the CRFMP's rebuilding goals and harvest sharing objectives, unless other land and water management activities that impacted the fisheries resource were also addressed. The parties therefore pledged to use their best efforts to integrate the CRFMP's goals and objectives into other programs and plans required by or adopted under other state and federal laws. To deal with the dynamic nature of the fisheries resource, the parties developed a process for monitoring the performance of the Plan and for modifying its provisions as needed to meet rebuilding and allocation goals.

A key aspect of harvest management under the CRFMP is the tribes' voluntary agreement to significantly greater harvest restrictions than could be imposed upon them under case law principles in order to rebuild depressed runs. Thus, any unilateral changes to harvest management that are not agreed to by the tribes must meet the standards set forth by the case law.

Under the standards set in *United States v. Oregon* and related proceedings, the treaty fishery can only be restricted after certain conditions have been met. First, it must be established that the proposed restrictions are both reasonable and necessary for preservation of the species; the burden of establishing such facts is on the party proposing the restrictions. Second, in order to be deemed necessary, the proposed restrictions must be the least restrictive measures available to achieve the required conservation purpose. Third, it must be determined that the conservation purpose of the proposed restrictions cannot be achieved solely by regulation of non-Indian activities. Fourth, the proposed restrictions may not discriminate against Indians exercising their treaty rights, either as stated or applied. And fifth, voluntary tribal actions are not adequate to achieve the conservation purpose.

The Team's proposal to modify the existing harvest management regime creates two major concerns: recommendations to unilaterally modify the CRFMP ignore the adverse impacts such actions would have on the integrity of the CRFMP and the co-management process; and the classification of proposed restrictions on treaty harvest as "conservation" measures rather than as allocation issues would unfairly place additional burdens on the tribes' treaty fisheries.

Because the Department of Commerce is a signatory party to the CRFMP, it (and the agency which represents it in *U.S. v. Oregon* - NMFS) is subject to the same rules for modifying the CRFMP as apply to all other parties. Although the CRFMP contains provisions for review and modification, none of these provisions provide that any party may unilaterally revise the CRFMP over another party's objections. Departure from the provisions prescribed by the CRFMP may require the Department of Commerce to withdraw from the Plan. Although the CRFMP does provide for any party to now withdraw from the Plan, if the Department withdrew from the CRFMP, such an action could trigger the withdrawal of other key parties. This would destroy the integrity of the CRFMP and, perhaps more importantly, the co-management process that has developed through the CRFMP. In addition, such an action could place the Department of Commerce at odds with the Department of Interior, the other federal signatory to the CRFMP, and the Department of Justice.

In addition, the Draft Plan's recommended actions to further restrict treaty fisheries would not meet the legal standards described above, nor the trust responsibility of the federal government to the tribes. Indeed, many of the issues identified in the draft plan as "conservation" concerns are more accurately classified as allocation issues. For example, by recommending that harvest mortalities on listed Snake River salmon be reduced to zero, but not recommending similar levels of reductions for other sources of salmon mortality, the draft plan continues the 140 year effort to minimize the tribes' treaty-reserved allocation rights.

For far too long, numerous actions undertaken or permitted by the state and federal agencies have directly or cumulatively diminished the fishery resource and consequently impacted the tribes' abilities to exercise their reserved fishing rights. In negotiating the treaties, the tribes did not envision nor sanction the U.S. government using or allowing the use of the resource common to each sovereign in a manner that would diminish its availability to the other.

The Draft Plan does not equitably distribute the burden of salmon recovery among the various sources of salmon mortality.

A key element of salmon recovery must be the equitable distribution of the recovery burden. However, the Team's recommendations place a disproportionately high burden for salmon recovery on treaty fisheries. The treaty fishery is one of the few sources of salmon mortality for which the Team sets measurable performance standards and the only source for which the Team recommends an eventual mortality of zero. The Team's recommendations, if adopted, would amount to a *de facto* abrogation of the tribes' treaty rights.

The tribes' treaty secured fishing rights require that the burden for conserving the listed Snake River salmon stocks must not be disproportionately placed on tribal fisheries nor may the "conservation" aspects of the recovery plan discriminate against tribal fisheries. Unfortunately, the draft recovery plan does both. Despite the fact that for every one salmon an Indian catches, non-Indian development activities kill at least one hundred salmon, the tribes' small harvests are still being blamed for the decrease in salmon. The truth is, the dams are by far the biggest "net" in the river; operation of the hydrosystem must change if salmon restoration is to become a reality. Therefore, NMFS must modify the Team's recommendations such that the first recovery actions implemented are those actions which remedy the major factors causing the decline of the stocks of concern. This is, in fact, the policy NMFS enunciated for setting priorities in its own recovery planning guidelines.

In the event that more severe reductions in the tribes' treaty fisheries are desired by NMFS to conserve listed Snake River stocks, those reductions must not be sought without prior implementation of reductions for all non-treaty fisheries, as well as for other sources of mortality. Where conservation of a species is at issue, the legal standards described above must be met before a federal agency takes unilateral actions that affect the rights reserved by Indian tribes.

In short, the draft plan clearly does not provide for equitable distribution of the recovery burden. The burden of recovery must fall most heavily on the largest sources of salmon losses as measured in adult equivalents. All other sources of salmon mortality must be addressed before any additional conservation burden is assessed against the tribes' treaty-secured fisheries.

The Draft Plan mischaracterizes the causes for decline of Snake River salmon stocks.

The causes for decline of Snake River salmon stocks (and the impediments to salmon recovery) are not elusive; they are well known. The current depleted status of Snake River salmon stocks bears witness to the grim efficiency of non-Indian domination of Columbia basin anadromous fisheries and their habitat. Habitat destruction, appropriation of water to non-fish uses, hydroelectric power production and inadequate mitigation programs, are the principle causes for the decline of Snake River salmon stocks. These same activities are also the principle impediments to salmon recovery.

Accurate identification and description of the causes for decline is critical to determination of the conservation burden because those responsible for the decline in Snake River salmon should be accountable for restoring the resource. You can surely appreciate the tribes' sensitivity to this issue, given that the listed Snake River stocks (and indeed all Columbia Basin salmon runs) thrived for over 700 human generations under tribal management, while the near complete destruction of these stocks has occurred within a few generations under non-Indian management. Tribal fisheries and the economy and culture based on the fishery resource have suffered grievously due to the drastic reductions in productivity related to habitat loss and the concomitant increase in salmon mortality caused by non-Indian development activities.

The Draft Plan's recommendations for delisting criteria are inconsistent with the Columbia River tribes' treaty fishing rights.

Criteria for delisting Snake River salmon stocks must be consistent with the continuation of treaty fisheries and must not denigrate the value the tribes attach to their treaty fishing rights. The federal government's duties under its treaties with the tribes extend beyond the need to merely ensure the viability of salmon stocks as required by various federal laws. The federal government has an obligation to provide for harvest adequate to meet tribal needs as contemplated during treaty-making. The tribes did not reserve a right to take a few fish from remnant runs hovering just above some arbitrarily set numerical delisting criteria.

The Team's approach to establishing recovery goals and delisting criteria is primarily political rather than biological. The Team failed to review and incorporate significant information from the scientific literature on the development of recovery goals and management objectives for distinct population segments. Such review should have been the foundation for development of the Team's recommendations. Instead, the Team accepted NMFS' untenable evolutionarily significant unit (ESU) concept, and then applied the ESU concept in such a way that recovery of a healthy population structure for the listed Snake River salmon may be impossible.

The performance goals recommended by the Team for the various life stages also do not reflect a fair allocation of the recovery burden. For instance, the draft plan recommends that in-river juvenile survival be "improved," while passage through fisheries be "maximized." This is but one example of the unfair standard in the accountability between the various aspects of the life cycle and reflects an inequitable distribution of the conservation burden.

For species with complex life histories, such as chinook and sockeye, measurable improvements in survival rates for each major life history stage must be specified. The Team failed to develop an analytical tool incorporating all aspects of the life cycle and relating implementation of proposed actions to the probability of extinction. Such a tool is needed for developing an ESA recovery plan and for tracking the progress of water, land and fishery management actions toward meeting recovery goals.

The Draft Plan fails to recognize and build upon other federal authorities and responsibilities to conserve salmon, both domestically and internationally, and does not comport with the requirements of the ESA.

The Team's Draft Plan will require significant modifications to be of any use to NMFS because it failed to integrate on-going federal obligations under treaty, statute, or federal case law. In essence, the Team embarked on a policy level evaluation that eliminates options before NMFS and other responsible federal agencies have an opportunity to exercise management discretion consistent with their continuing legal responsibilities. Many of the Team's recommendations are inconsistent with continuing international obligations, specifically those obligations under the U.S.-Canada Pacific Salmon Treaty. The Team also failed to recommend actions consistent with the statutory directive to federal agencies that they are to use their authorities to further the conservation goals for protected species as provided in Section 7(a)(1) of the ESA.

NMFS should not adopt short-sighted recommendations that would continue to undercut the mandate and goal of the United States and the tribes under the U.S.-Canada Pacific Salmon Treaty. This caution is especially pertinent to the Draft Plan because one of the underlying purposes of the ESA is to support international agreements that deal with shared conservation problems on a proactive basis such as the Pacific Salmon Treaty.

After more than a decade of fruitless negotiations, the United States and Canada finally entered into the U.S.-Canada Pacific Salmon Treaty of 1985 largely because of a coastwide crisis in chinook stocks. The Commission's member tribes were instrumental in seeing the negotiations through to a successful conclusion. Critical to the tribes' support, as well as the support from the region as a whole, was the Treaty's inclusion of the chinook rebuilding program and the Conservation Principle.

The chinook rebuilding program instituted substantial chinook harvest constraints, coastwide, so that the Parties to the Treaty could undertake necessary domestic conservation actions that would provide for the optimum production of all salmon, specifically targeting 1998 as the year that chinook stocks should be rebuilt coastwide by both Parties. The Treaty obligation "to prevent overfishing and provide for optimum production," known as the Conservation Principle, coupled with the Treaty's Equity Principle, which provides that the benefits of enhancement actions should accrue principally to the Party undertaking such actions, provided both the mandate to go forward with measures to restore naturally spawning chinook stocks and the promise that the region would benefit from such actions.

To land and water managers, the signing of the Treaty was a signal to undertake salmon restoration measures that those same managers had dragged their feet on, claiming that Canadian fishing interceptions would negate any benefits to the region. Unfortunately, federal land and water managers did not make the necessary changes in the manner in which they provided for the rebuilding and optimum production of Columbia and Snake River salmon stocks.

The Draft Plan does not provide for those changes to now be made. The Draft Plan does not identify all the areas in which federal agencies are not utilizing their existing authorities to conserve Snake River salmon stocks. Where existing federal authorities to conserve these stocks are noted, the Recovery Team recommended that the affected agencies do less than they are required to do by law. NMFS, or another party, must identify actions that can now be undertaken and statutory or regulatory weaknesses that must be rectified if it is truly to continue to act as a steward of the resource.

Under the ESA, the purpose of a recovery plan is the conservation and survival of the listed species, which necessarily and specifically requires the conservation of the ecosystem upon which the species depends. Because the Draft Plan falls far short of meeting the ESA's legal mandates, NMFS must now take responsibility for development and implementation of a recovery plan that incorporates: (1) a description of site specific management actions; (2) objective, measurable criteria which, when met, would result in a species' delisting; and, (3) the time and costs required to carry out measures needed to reach the plan's goal, as well as for intermediate steps towards that goal. NMFS must address the factors for decline, identify specific actions and develop measurable criteria which assure that none of the factors specified for listing continue to be a threat.

Conclusion

For many years, the Commission and its member tribes have worked with various federal entities, including NMFS, on efforts to protect and restore Columbia Basin anadromous fisheries. Because the federal presence in the Columbia Basin is extensive and diverse and because salmon protection, enhancement and restoration efforts are critical to upholding and implementing the tribes' reserved treaty rights, all agencies of the federal government must respect the federal trusteeship and exercise their responsibilities to the tribes in a judicious manner. Unfortunately, we have witnessed inconsistent and uncoordinated federal positions with regard to fishery resource protection and restoration. Too often, federal agency action has diminished the fishery resource at great cost to the tribes' treaty rights and their economy, culture and religion.

The Team's draft recovery plan recommendations do not contain measures necessary to restore listed Snake River salmon stocks, nor would they support the federal government's obligations to secure and protect the tribes' treaty reserved rights to take fish at all usual and accustomed places. Now is the time for the federal government to live up to its promises to the tribes and to begin working with them in a government-to-government relationship that puts the tribes' treaty reserved rights back in the forefront of decision-making.

Over the past several decades, while the tribes have closed fishery after fishery to conserve the resource, in the hope of protecting and rebuilding this ancient and priceless cornerstone of their culture for future generations, non-Indians have prospered from cheap power, cheap water, and subsidized grazing, agriculture, and logging. These industries have

prospered, in part, by being allowed to destroy the fish which are the heart of the tribes' treaties and culture. These industries must now internalize the costs that their activities have imposed on the resource and shoulder their due share of the burden in the restoration of the Columbia's salmon runs.

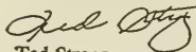
When the impacts of development activities in the basin led to the decline of salmon runs, non-Indian resource managers failed to protect native salmon and instead focused on hatchery production. During this time, token efforts of state and federal agencies to conserve the native salmon usually involved fishing restrictions. Many of these fishing restrictions were initially concentrated on treaty fisheries. Time and again, the tribes sought equitable relief in federal court and successfully invalidated the attempts of non-Indian resource managers to inequitably apportion the burden of conservation on Indian fisheries. Despite harvest restrictions and fishery closures, the runs have continued to decline to the point where some of the basin's once most productive stocks have been listed as threatened or endangered.

It is with both irony and anger that we note that the Team's draft recovery plan continues the failed policies of the past -- even more draconian restrictions of treaty-reserved fisheries with only minor changes required of those activities which destroy the vast majority of the remaining treaty resource. Such a course of action is ill-founded, illogical, and illegal. This abuse of the trust responsibility cannot continue.

We will take the opportunity to provide further comments as NMFS develops its recovery plan. We hope you and NMFS will understand and appreciate our position. If you have any questions, please call me at (503) 238-0667.

Thank you for your attention to this matter.

Sincerely,


Ted Strong
Executive Director

Attachment

cc: Honorable Ronald H. Brown, Secretary of Commerce
Honorable Bruce Babbitt, Secretary of the Interior
Honorable Ernest F. Hollings, Chairman, Senate Committee on Commerce,
Science and Transportation
Honorable Gerry E. Studds, Chairman, House Committee on Merchant Marine
and Fisheries
Honorable Daniel K. Inouye, Chairman, Senate Committee on Indian Affairs

Managing Molecules or Saving Salmon? -The "Evolutionarily Significant Unit"

Thomas W. H. Backman¹ and Laura Berg

Columbia River Inter-Tribal Fish Commission

729 N.E. Oregon, Suite 200

Portland, Oregon 97232

ABSTRACT

The purpose of the Endangered Species Act is to revitalize animal and plant populations on the brink of extinction and to protect the ecosystems that support them. The act has provisions to preserve habitat and develop a recovery plan. The act allows for protection of a biological species, a sub-species, or what the act calls a distinct population segment. Federal listing policies can hamper actions to restore extirpated or weak fish stocks.

¹ Author responsible for correspondence

Introduction

Sockeye and chinook from the Snake River, the Columbia's largest tributary, have been listed for protection under the Endangered Species Act. But many of those committed to helping save Columbia River salmon question whether the National Marine Fisheries Service (NMFS) will effectively use the act to rebuild the salmon species now facing extinction. They fear that a recovery plan will be too many years in the making and that it and other protective measures will not be enough. They also worry that scientific debate and uncertainty over questions about "species" definitions and the role of genetics will be used to slow or even sabotage salmon restoration. This article describes what some of that debate is about and what the implications are for Columbia Basin salmon.

Species Definition

A widely accepted scientific definition of a species is derived from the biological species concept which emphasizes that members of the same species interbreed. In other words, for most animals and many plants, a species is a group whose members breed within the group, but do not usually breed with members of other groups. A biological species is said to be reproductively isolated. (Templeton 1989).

Within a species there are no major differences in genetic composition nor in characteristics strongly controlled by genes. Minor differences may occur, and a group exhibiting those different characteristics may be classified as a sub-species. Such differences often arise because of geographic separation. When geographic separation continues and (genetic) differences increase, a sub-species may evolve traits that enforce reproductive isolation. At this point, a subspecies may be recognized as a new species.

Zoologists do not officially recognize groups below the subspecies level (Stace 1989). However, it is often desirable and useful to recognize groups such as races and varieties. The terms refer loosely to minor differences within a species, for example, stocks of salmon. The variety or race is often recognized by ecological characteristics, such as differences in the migration timing of spring, summer, and fall chinook.

The Endangered Species Act also allows for protection of a "distinct population segment." Under the act, a distinct population segment can be protected using a wide range of criteria (geographic, economic, aesthetic, political, biological among others), provided group members can interbreed when mature. Because Congress defined "distinct population segment" in only very broad terms, the National Marine Fisheries Service (NMFS) felt obligated to establish a policy that would explain how "distinct populations segment" applied to Pacific salmon (Waples 1991).

In 1991 NMFS (56 F.R. 58612) declared that a distinct population segment would be recognized only if the interbreeding population met two criteria: "(I) It must be substantially

reproductively isolated from other conspecific [in the same species] population units, and (2) It must represent an important component in the evolutionary legacy of the species." The federal fish agency designated such a group an "evolutionarily significant unit," or ESU.

Unfortunately, rather than explain DPS, the new definition has generated a quagmire of confusion and illogic. In the case of Columbia Basin salmon, reproductive isolation, the definition's first criterion, is difficult to evaluate. After over a century of habitat degradation and passage blockage, the few remaining populations are small and greatly fragmented. The isolation we now observe may not be natural, but an artifact of "civilization." Furthermore, countering this isolation is the tendency of salmon to stray into new areas and produce progeny that return there to spawn. In any event, the fact of geographic isolation does not necessarily indicate reproductive isolation.

The second criterion, evolutionary importance, is vague and highly subjective. Does it refer to genetic material in salmon species descended from salmon of the 1850s? Or to present-day genetic material of importance to the future success of a species? Does it refer to differences in life history and body form? Does it mean something measured in the genes or in the environment?

Add to these ambiguities the problem of the ESU definition being nearly the same as the species definition. According to NMFS, an ESU is characterized by reproductive isolation and by uniqueness (evolutionary significance), which are the same considerations used in defining a species. Once a salmon population is determined to be an ESU, what has been identified, according to the definition, is more like a species than a group below the species level, such as a distinct population segment.

Electrophoresis Is Used to Identify ESUs

In practice, NMFS relies almost exclusively on genetic testing to predict evolutionary significance and reproductive isolation in determining whether a salmon population is an ESU. Using electrophoresis, NMFS scientists differentiate populations by comparing the proportion of individuals in each population according to particular types of proteins. They reason that the larger the differences in these proportions of proteins, the longer the time of reproductive isolation. The agency's scientists infer that populations presumably isolated for a long time are likely to have developed unique characteristics that must be protected. The same results can occur when a common historical population undergoes a series of genetic bottlenecks and population fragmentation as depicted in Figure 1.

However, predicting evolutionary significance from minute differences in protein composition is largely speculative: there is no known way to associate biochemical differences with important characteristics, such as length of reproductive isolation or adaptive traits, and no way to correlate the degree to which a population represents a historical population.

Despite these and other problems with electrophoresis, NMFS not only relies on it, but exacerbates these problems by using electrophoretic results inconsistently: When NMFS scientists used protein analysis to study Snake River spring, summer, and fall chinook, they found a 0.005 genetic difference between fall chinook and spring/summer chinook. Based largely on these results, Snake River fall chinook were found to be an ESU and were listed as threatened. Snake River spring/summer chinook were also listed, but lumped together as one ESU because test results showed a magnitude of difference between spring chinook and summer chinook of less than 0.005. (Apparently, springs and summers are not sufficiently reproductively isolated.)

When NMFS scientists examined the genetic material from lower Columbia River coho, they again detected a 0.005 genetic difference--this time between coho spawning in streams and those that were spawned in hatcheries. Despite this finding, the federal agency determined that lower river wild or naturally spawning coho possessed no distinct evolutionary legacy (NMFS 56. F.R. 29553). Thus, NMFS did not provide Endangered Species Act protection for the few remaining lower Columbia River wild coho.

The federal fish agency made this decision on coho even though its own scientists acknowledged that coho exhibit lower rates of variability in electrophoretic tests. (In other words, the difference could have been smaller, but still significant in terms of the uniqueness value NMFS was testing for.) These natural runs of lower Columbia River coho could not be evolutionarily significant, according to NMFS (56. F.R. 29553), because "the extent and duration of [hatchery] releases suggest that naturally spawning populations in these streams are mixtures of the native and introduced hatchery stocks."

ESU Compromises Genetic Diversity

Snake River sockeye provide a different kind of example. These sockeye were found to be evolutionarily significant and were listed as endangered. NMFS scientists did not base the decision on electrophoresis because there were too few Snake River sockeye to study. Instead the agency based its decision largely on the presumption that these sockeye were genetically unique because they swim far inland to high altitude lakes.

"Sockeye," the biological species, are relatively abundant in other portions of their historical range, for example, in the far inland Okanogan and Wenatchee watersheds as well as other places from Washington to Alaska. Yet the recovery effort is focused on breeding the three males and one female Snake River sockeye that returned to Redfish Lake in 1991. Because NMFS identified these four sockeye as an ESU, it concluded that they could not be bred with any other Columbia Basin sockeye. To breed them with other basin sockeye would result, NMFS implied, in hybrid fish that are no longer unique nor evolutionarily significant. Apparently this means that if the Snake River sockeye run cannot be recovered from the few remaining fish, it simply dies out.

The offspring of these sockeye--and a male that returned this year--will be held in two hatcheries as part of a captive breeding program. The resulting progeny will not be released into the river to migrate, but will be kept in captivity for their entire lifespan to increase their chances of surviving and producing offspring. Theoretically, at a future date when the population reaches some, as of yet, undetermined numerical and biological strength, the resulting offspring from the captive breeding stock will be re-introduced to their natural habitat.

Limiting this endeavor to the progeny of a few sockeye has enormous genetic risk. When a population is subject to inbreeding because of severely restricted numbers over a protracted period, as Snake River sockeye have for the past 50 years or more, a great deal of genetic diversity is lost. (Geneticists call this a genetic bottleneck, see Figure. 1.) To limit broodstock for recovering the Snake River sockeye to four plus fish is to further restrict that diversity. Small populations possess little genetic variability and are therefore at great risk of extinction because of inbreeding and/or the inability to deal with environmental changes over time. Many potential genetic problems face small populations. Those problems include increased juvenile mortality due to inbreeding, loss of genetic diversity through founder effect and genetic drift, the physical expression of deleterious recessives, interaction of demographic and genetic effects, and inadvertent selection for domestication (Ralls and Ballou 1986). Although not a genetic risk factor, a single catastrophic event--a power outage, for instance--could also wipe out an entire captive population.

The genetic diversity that enables a salmon species to persist over time is found within the whole range of that species. Trying to keep the genetics of salmon static in a rapidly changing environment, as NMFS' captive breeding program is attempting, works against natural evolutionary processes. Only by providing a species with its full genetic diversity might it then be able to adapt and survive under changing conditions. For a population that has experienced severe genetic bottleneck, the added diversity from interbreeding with other populations (hybridization) can provide that advantage.

Hybridization Is a Natural Occurrence

For a time, the U.S. Fish and Wildlife Service had an official policy against hybrids. The agency abandoned the policy in 1990 (FWS. CW. 0440), after finding "new biological information [that] casts doubt on the validity of the absolute pronouncements relied upon [earlier], since in some cases introgression between taxa is not only a naturally occurring phenomenon but may also be a necessary recovery measure to avoid the loss of a seriously depleted listed taxon."

In a March 1991 *Science* article about the Endangered Species Act, the founder of the biological species concept, Dr. Ernst Mayr, and his associate, molecular biologist Dr. Stephen J. O'Brien, emphasized that "living organisms are constantly evolving and that over time hybridization may result in new, unique species." Mayr and O'Brien pointed out that, in the case of endangered or threatened species, a ban on hybridization between sub-species or

populations may in fact disrupt that important natural process.

This is particularly true for salmon. Having survived for thousands of years and through radically different environments, salmon have developed some highly successful reproductive characteristics (Thorpe 1986) that have fostered an exceptional degree of natural hybridization: Salmon possess remarkable migratory ability and range; yet they are susceptible to straying; and they will colonize new and reclaim former habitats. These behaviors have allowed them to breed with numerous other populations.

Yet NMFS seems to be saying that an ESU cannot include hybrids. If a population, designated as an ESU, were to breed with another population, the federal fish agency would no longer recognize it as evolutionarily significant for purposes of the act.

Hatchery Fish and Genetic Diversity

In addition, according to NMFS' final determination on Snake River chinook, a hatchery fish "should not be considered part of the evolutionarily significant unit for listing purposes." Presently no hatchery fish, only populations spawning in nature, can be considered of evolutionary significance. Thus, spring chinook of Rapid River Hatchery origin are currently excluded from protection or use in Endangered Species Act recovery efforts even though they are all that remain of the spring chinook that historically spawned in the Snake River above Hells Canyon Dam.

The federal fish agency has acknowledged, however, that, "it is important to address whether any existing hatchery population can be considered part of the evolutionarily significant unit, and therefore potentially be used in recovery efforts." A determination will not be made until the agency issues a final decision on the role of artificial propagation in carrying out the Endangered Species Act.

NMFS scientists are worried about unwisely altering the genetic composition of fish stocks. However, hatchery technologies can be used to ameliorate such risks. The act itself specifically endorses conservation methods such as artificial propagation and "transplantation" to recover imperiled animals or plants.

Actual experience shows that many crosses of wild and hatchery salmonids have exhibited hybrid vigor. In fact, the scientific literature on breeding across various genetic lines suggests that hybrid vigor—not reduced survival—is the general rule (Wohlfarth 1986). When environmental conditions change, hybrids often do better than their parents. These offspring have greater genetic diversity and thus have a greater potential of fitting into a fluctuating environment such as the Columbia River system.

Because, under the NMFS' definition of evolutionary significance, a species is recognized as a group possessing unique genetic information, the goal becomes not the restoration of populations to healthy, productive levels by maintaining genetic diversity and robustness,

but the preservation of very small, highly inbred and supposedly wild populations that represent mere fragments of historical salmon runs.

Implications for Habitat Protection

The NMFS captive breeding program relies on very gradual increases from such low starting numbers that, at best, it will take decades to rebuild the threatened and endangered Snake River salmon runs. A sad consequence of such an extended timeline is its potential use as a rationale for indefinitely postponing habitat restoration and protection. There is less incentive to revive and maintain healthy lakes and streams in the Snake River Basin (and elsewhere) when no significant numbers of fish are going to be put back in these waters for years to come, if ever.

By excluding segments of the salmon populations, NMFS policies and practices may actually hasten the loss of the very populations we are fighting to save. By concentrating on the study of protein molecules, the agency is losing sight of the bigger basinwide problem of salmon depletion.

While looking through the wide end of the telescope, the ESU policy fails to recognize the role of salmon in the ecosystem. Highly migratory species in general and salmon in particular are to aquatic ecosystems as rain is to the hydrologic cycle. They are a biological link between ocean and freshwater ecosystems. Abundant and diverse salmon runs are required for the productive life of many oligotrophic lakes and streams. Salmon are vital food source for many species, including humans, and for the Northwest's indigenous peoples, salmon also provide cultural sustenance.

What may be the most alarming related development in the Columbia Basin is the institutionalization of ESU as the operational philosophy for fish restoration--whether or not the salmon runs in question are listed under the Endangered Species Act. Such a development could prevent rather than aid salmon recovery.

The ESU approach is similar to a trend in current state and federal habitat and fish production policies in which managers operate on the basis of remnant fish run management. As with the ESU policy, this kind of management deals with fragmented populations as if each were the historical population. For example, because each dwindling fish run is considered separate and distinct, none is acceptable as broodstock for supplementing fish runs elsewhere in the basin. In this way, managers think they are preserving genetic uniqueness.

Many regional business and political leaders also seem satisfied to support the preservation of a smattering of Columbia River salmon as a reminder of something called "our wild heritage." However, under remnant run (or ESU-style) management, the numerous, small and isolated fish run fragments will continue to be threatened by inbreeding and vulnerable to local extinction from environmental and natural disasters.

In fact, the curious logic of remnant run management and genetic scare tactics have already been used to delay, if not stop, tribal plans to use artificial propagation technology to increase naturally spawning salmon populations in the Columbia River above Bonneville Dam.

Few others, except the Indian Tribes, now emphasize restoring large viable salmon runs at "usual and accustomed" locales throughout the Columbia Basin. To the Indian people, this lack of concern is nothing new. For more than a hundred years, they have watched as others have decimated the resource as a tradeoff for "progress."

If the region is ever to recover large viable salmon populations, it cannot do so by relying on current NMFS preservation policies. An alternative approach with real potential for success would emphasize genetic diversity and the use of all the appropriate genetic materials and management tools available. It would likely involve the introduction of some genetic material from outside the existing local populations. While there are some risks, such an approach would improve the odds for rebuilding salmon populations that can adapt and survive in the natural environment.

References

O'Brien, S. J. and E. Mayr 1991. Bureaucratic Mischief: Recognizing Endangered Species and Subspecies. *Science* 252:1187-1188.

O'Brien, S. J. and J. F. Evermann. 1988. Interactive influence of infectious disease and genetic diversity in natural populations. *Trends in Ecology and Evolution* 3(10):254-259.

Ralls, K. and J. D. Ballou. 1986. Preface to the Proceedings of the Workshop on Genetic Management of Captive Populations. *Zoo Biology* 5:81-86.

Stace, C. A. 1989. *Plant Taxonomy and Biosystematics* --2nd ed. Edward Arnold, London. vii + 264.

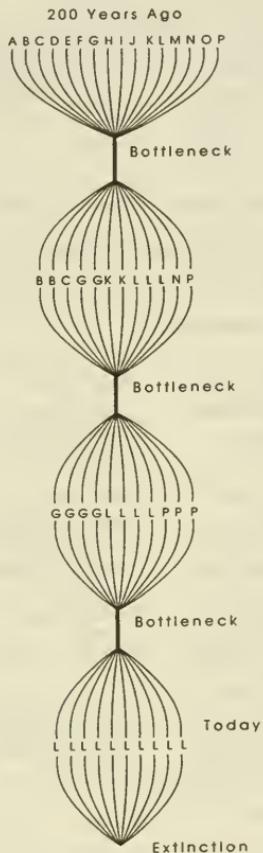
Templeton, A. R. 1989. The Meaning of Species and Speciation. Pages 28-59 in D. Otte and J. A. Endler eds. *Speciation and Its Consequences*. Sinauer Associates, Inc., Sunderland, MA.

Thorpe, J. E. 1986. Age at First Maturity in Atlantic Salmon, *Salmo salar*: Freshwater Period Influences and Conflicts with Smolting. *Can. J. Zool.*, 64:2439-2446.

Waples, R. S. 1991. "Pacific Salmon, *Oncorhynchus* spp., and the Definition of "Species" under the Endangered Species Act." *Marine Fisheries Review*, 53(3):11-22.

Wohlfarth, G.W. 1986. Decline in natural fisheries - a genetic analysis and suggestion for recovery. *Can. J. Fish. Aquat. Sci.* 43:1298-1306.

Figure 1. A schematic representation illustrating what can happen to the genetic diversity of a salmon run over time as a result of genetic bottlenecks. The letters represent different genetic characteristics. The resulting fragmented populations appear to have different ancestries. Bottlenecks are severe population reductions caused by human induced and/or natural changes such as habitat destruction. (Adapted from O'Brien and Evermann (1988).



Adapted from TREE Vol.3, No.10, October 1988

Comparison of Columbia River Salmon Plans

Subject Area	Tribal Restoration Plan	Strategy for Salmon	Bevan Recovery Plan
Harvest	Acknowledges and builds on tribal, state and federal commitments in <u>U.S. v. Oregon</u> and chinook rebuilding program of Pacific Salmon Treaty.	Recognizes Columbia River Fish Management Plan processes and urges parties to CRFMP to take restrictive actions.	Calls for elimination of tribal fisheries carried out for thousands of years and guaranteed by treaty with the U.S.
Hydropower	Calls for immediate water management actions, such as flow and spill, to improve the survival of juvenile and adult salmon.	Provides limited volumes for flow augmentation. Supports drawdown (presumptive path).	Calls for further studies before taking additional actions.
Management control	Cooperative tribal, state and federal management approach.	Depends on approval and funding by BPA F&W division.	Places NMFS in charge.
Habitat	Specific land management prescriptions and habitat standards with technical justification for implementation by state and federal agencies.	Calls for maintaining and improving habitat quality. Processes to carry out measures poorly defined.	Vague descriptions of desirable habitat characteristics with additional committee processes to determine applications.
Implementation Focus	Based on 23 watershed action plans that identify specific restoration measures.	Extensive Council review and approval processes.	Centralized planning to be carried out by NMFS and a new Salmon Oversight Committee.
Salmon Production	Focuses on rebuilding salmon stocks throughout watersheds taking into account demographic and genetic risks associated with low population levels (e.g. in-breeding).	Cumbersome process to review supplementation experiments.	Focuses on outbreeding depression. 38 subpopulations of Snake River salmon identified. No mixing of subpopulations in breeding programs.
Geographic Scope	Anadromous fish stocks above Bonneville Dam.	Entire Columbia Basin.	Only salmon stocks in the Snake River Basin listed under the ESA.

Testimony of
Rolland A. Schmitt
Assistant Administrator for Fisheries
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Before the

Subcommittee on Environment and Natural Resources
Committee on Merchant Marine and Fisheries
U.S. House of Representatives

June 30, 1994

Mr. Chairman and Members of the Subcommittee: I am Rolland Schmitt, Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. I am pleased to be here today to discuss the recovery of salmon stocks in the Pacific Northwest that are listed as threatened and endangered under the Endangered Species Act (ESA).

Before proceeding, I want to take this opportunity to recognize the hard work of the Snake River Salmon Recovery Team (Team) in developing recommendations for the recovery of the three listed stocks of Snake River salmon. The Team spent hundreds of hours addressing many difficult issues, including downstream passage of juvenile salmon, protection and restoration of spawning and rearing habitat, harvest levels, hatchery management, and the recovery goals and criteria for delisting. In a recent letter, a member of the Team said that he was "astonished at the extent to which my team colleagues carried their sense of responsibility," and I believe this strong sense of responsibility is reflected throughout the Team's recommendations.

Today, I would like to make three preliminary points. First, the Snake River recovery plan is part of a larger effort to conserve and rebuild all Pacific salmon stocks. Second, given the variable biological and physical conditions evident in recent years in the Pacific Northwest, it may be necessary to adopt actions which affect other uses of the rivers to ensure recovery of salmon stocks. Third, I am convinced that the Team's recommendations, plus other information, will provide the National Marine Fisheries Service (NMFS) with the basis for developing a plan that will lead to the recovery of these listed species.

RECOVERY PLAN PART OF LARGER EFFORT TO CONSERVE STOCKS:

The work of the Team must be considered within the context of other efforts in the Pacific Northwest to address the continuing decline of multiple salmon stocks. We support efforts to address the situation comprehensively through the development of both basin-wide and regional plans. For example, NOAA is an active participant in the President's Northwest Forest Plan for Federal forest lands west of the Cascades. The standards and guidelines of the President's plan are guided in part by an aquatic conservation strategy that protects salmon habitat. East of the Cascades, the PACFISH initiative of the Forest Service and the Bureau of Land Management applies the same conservation principle.

identified. These issues must then be integrated into the implementation of the recovery program.

An effective recovery program requires the participation and coordination of all entities with an interest in rebuilding depleted salmon stocks. This includes state, local, and tribal representation, as well as that of interests which rely on the resource for jobs and recreation. A plan will be successful only if all these parties participate and commit to finding and supporting the process which will address the problems.

CONSTANTLY CHANGING SITUATION:

My second point is to emphasize that NOAA will be crafting a final recovery plan in a highly dynamic environment. Effective decision-making on long-term solutions must occur in a context of constantly changing environmental conditions, a constant influx of new scientific information, and ongoing litigation. Consider the following statistics:

--Runoff in 1994 for the Snake River Basin is expected to be less than 50 percent of normal. This is the seventh consecutive drought year in the Snake River Basin.

--Coast-wide, the chinook salmon harvest in 1982 was 1.4 million fish from Washington, Oregon, and California. The 1994 estimated harvest will be only 220,000 fish

Under the President's Northwest Forest Plan, funding has been provided to restore salmon habitat damaged by logging and road-building practices. This initiative has the purpose of not only providing important "jobs in the woods" in the Northwest, but is speeding the process of recovery in degraded salmon streams.

NMFS, the U.S. Fish and Wildlife Service, and Environmental Protection Agency are cooperating in the development of a non-Federal habitat initiative to establish guidelines for maintaining salmon habitat and to educate landowners on how land management activities affect salmon production. These guidelines will assist landowners in developing and implementing habitat conservation plans pursuant to section 10 of the ESA.

Individual recovery plans, such as that for Snake River salmon, must be reviewed with an eye on these larger regional strategies to conserve salmon. It is through these types of ecosystem approaches that we feel the greatest long-term benefits can be attained. However, we still must move forward with recovery efforts, as we may not be able to wait for these broader efforts to bear fruit.

On an institutional level, a similar "ecosystem" principle applies to coordinating recovery efforts. We know that before a lasting agreement can be reached on a recovery program for salmon, the political, economic, and legal issues must be

(an 84 percent decrease), and will have a devastating effect on fishing and related industries, and tourism.

--The Snake River spring/summer chinook run in 1994 may be the lowest ever, with as few as 1,900 naturally spawning adult fish reaching Idaho. This compares to an average of 20,000 during 1986-90, a level so low it led to the listing of these stocks as threatened in 1991. The agency has been asked to downgrade the listing of this stock to endangered.

--The Snake River fall chinook run in 1994 also is expected to be low. The number arriving in Idaho may barely reach 200, the level that led to listing this stock.

To address this escalating problem, as well as the low numbers of coho salmon, the Pacific Fishery Management Council took a dramatic first step this year and recommended to the Secretary of Commerce the closure of practically all ocean fishing off Washington and Oregon. In addition, the States of Oregon and Washington are proposing to eliminate almost all commercial fisheries in the lower Columbia River.

NMFS RECOVERY PLAN:

In December 1991, NMFS appointed a seven-member scientific recovery team (three fisheries scientists, one economist, two engineers, one ecologist) comprised mostly from the academic

community to develop a Snake River salmon recovery plan. To ensure a comprehensive, ecosystem approach to recovery planning, the team was directed to address in one plan the three species of listed Snake River salmon.

NMFS has used an open process to ensure participation by all interested groups. For example, all scientific information and comments related to the ESA process have been deposited in an administrative record which is available for review in four separate locations (Seattle, WA; Portland, OR; Boise, ID; and Washington, DC).

A Technical Committee comprised of biologists from the states, Federal agencies, Indian Tribes, public utilities, and other interested entities was established to provide information and to review and comment on the data in the record. Technical Committee meetings are open to the public.

NMFS has established an Economics Technical Committee comprised of economists from the states, Federal agencies, Indian Tribes, public utilities, and other interested entities to ensure that the economic information is available to complete the critical habitat designations and to develop recovery plans.

The Team released its draft recovery recommendations in October 1993 for scientific peer review, and on June 14 submitted its

final recommendations to NMFS. We intend to use the Team's recommendations as an important component of the final NMFS recovery plan. However, NMFS will prepare independently that document after taking into consideration the views of the involved States and Indian Tribes. Before issuing a final plan, NMFS will publish in the Federal Register, for notice and comment, a proposed plan, including an analysis of the differences between the Team's recommendations and NMFS' proposed recovery plan. NMFS plans to publish its proposed recovery plan early this fall and approve a final plan by the end of this calendar year.

I would now like to turn to the specific questions you asked in your letter of invitation.

EVALUATION OF THE TEAM'S RECOMMENDATIONS: I would like to comment specifically on the Team's final recommendations to NMFS. The recommendations represent an important step in the recovery planning process. Our initial appraisal of the Team's recommendations is that they provide a framework from which we can propose a formal recovery plan in order to fulfill the requirements of the ESA.

We agree with the Team's conclusion that a myriad of different factors affects the survival of Columbia and Snake River salmon, and no single solution will lead to recovery. We also agree that

the recovery plan must be flexible and allow for modification based on new scientific evidence. However, there are certain factors that primarily are responsible for the decline of salmon. These are the construction and operation of the Columbia River hydroelectric system, commercial harvest, hatcheries, and habitat degradation. These factors must be given prominent consideration in recovery planning. We believe that addressing any single factor in isolation likely will not lead to recovery. Instead, NOAA will follow a comprehensive conservation strategy.

We agree with the Team that science must be the predominant consideration in recovery planning decisions. However, the importance placed on developing new information does not diminish the need for immediate action using the best available information, as mandated by the ESA. In the face of scientific uncertainty, and considering the precarious status of many Columbia River salmon stocks, recovery measures accompanied by careful monitoring and evaluation should be implemented without delay, and measures should be modified as new information indicates appropriate.

The recovery planning process for listed Pacific salmon represents one of the most complex conservation efforts ever undertaken. Pacific salmon, a resource of great aesthetic, cultural, ecological, economic, and historical value, are widely acknowledged for their complex life cycle and the challenges they

must overcome to reproduce successfully. Other complications are management by multiple jurisdictions (state, Federal, tribal, and international) and lingering adverse climatic effects (drought and poor ocean conditions).

The ultimate prescription for recovery of Snake River salmon has yet to be determined. However, we are convinced that a comprehensive conservation strategy, including the use of adaptive management, can be devised that will not only lead to the recovery of these threatened and endangered species, but also conserve other salmon stocks and avoid additional listings under the ESA.

COMPARISON OF ALTERNATIVE APPROACHES TO RECOVERY: NMFS has adopted Recovery Planning Guidelines that provide a framework for developing recovery plans for species listed under the ESA. Specifically, these guidelines state that measures called for in recovery plans must be prioritized to use available funding and resources in a manner that achieves the maximum biological benefits. When choosing among various strategies and combinations of measures that will achieve recovery, consideration must be given to the feasibility of the measure, uncertainty about the measures benefits and potential adverse effects, and cost.

We are trying to minimize any economic and social effects from implementation of recovery measures by attempting to select those less costly options where equal or greater biological benefits are expected. We acknowledge the difficulty in identifying the least cost alternatives. The recovery plan, however, will be based on the biological requirements of the species necessary for timely recovery.

ESSENTIAL ELEMENTS OF A RECOVERY PLAN: In addition to recommendations of recovery measures, a recovery plan must identify the cost of the measures to all affected parties, develop a schedule to implement each measure, and identify parties responsible for implementing them. Since these elements largely were absent from the Team's recommendations, NMFS currently is developing this information for inclusion in the proposed and final recovery plans. In addition, we have nearly completed a technical review of the Team's recommendations. As our analysis of existing and new scientific information dictates, we will update and provide additional detail/measures to the Team's recommendations.

CONCLUSION:

We encourage all affected interests to continue to contribute to the identification and the development of recovery actions. We believe that participation by State, Tribal and Federal agencies, academic institutions, environmental groups, private individuals

and organizations, commercial enterprises, and other affected parties is perhaps the most essential ingredient for recovering a species. We expect many groups to participate in implementing this recovery plan.

The Snake River Recovery Plan must be part of a comprehensive approach to protecting and restoring salmon. There is no "magic" solution. There is no technological breakthrough that will painlessly solve this problem. While implementing recovery measures, we must address the condition of the ecosystem as a whole. Only then can we be successful in our attempt to protect and restore salmon.

Pacific salmon will not be recovered this year, or even in the next few years. However, NOAA, in a fair and equitable manner, will use the ESA, as well as other applicable laws, to take advantage of every available opportunity to recover these species that are so vital to the economy and culture of the Pacific Northwest.

Thank you for the opportunity to be here today. I would be happy to address any questions you may have.



For Fish, Commerce and Communities

TESTIMONY OF

**BRUCE J. LOVELIN
EXECUTIVE DIRECTOR**

**COLUMBIA RIVER ALLIANCE
FOR FISH, COMMERCE, AND COMMUNITIES**

REQUESTED BY

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON MERCHANT MARINE AND FISHERIES**

**REGARDING RECOVERY OF ENDANGERED
COLUMBIA RIVER BASIN SALMON STOCKS**

JUNE 30, 1994

Chairman Studds and members of the House Committee on Merchant Marine and Fisheries, thank you for the opportunity to testify regarding recovery efforts for threatened and endangered salmon in the Columbia River.

My name is Bruce Lovelin, and I am the Executive Director of the Columbia River Alliance for Fish, Commerce, and Communities, an organization that brings together diverse entities throughout the Northwest in support of a balance of economic, biological, cultural and social values in management of the Columbia River system (attachment 1).

We believe in maintaining a strong multi-use river system for the economic health of our region and comprehensive efforts to preserve naturally spawning salmon that are based on good science, least cost and economic reality. We are committed to the ideal that regional commerce and naturally reproducing salmon are compatible.

As the region pursues salmon enhancement, it must realize that the deterioration of Columbia River Basin salmon runs occurred over more than a century (attachment 2), and that no single cause is responsible. Restoration of the run will at least require several decades, involve all aspects of the salmon's life cycle, and require a major commitment of all northwest parties.

\$350 Million for Northwest Salmon

Since the first Endangered Species Act petition was filed in March 1990, the region has devoted significant resources, expanding efforts for aiding northwest salmon. We have completed three regional planning processes; the Salmon Summit, the Northwest Power Planning Council Strategy for Salmon, and, the more recent, Snake River Salmon Recovery Team's Recovery Plan. In 1994, Northwest citizens and businesses will pay almost \$350 million for salmon enhancement through higher electric power rates. This is almost double the funding level of two years ago and it will almost certainly increase in the next few years. CRA members are concerned with our continued ability to fund these programs. The businesses, communities, and public that we represent are frustrated that although over \$1.5 Billion has been spent in the last 13 years, the salmon runs continue to decline. We believe that future funding is uncertain and were pleased with the Administration's recent acknowledgement of this fact with the announcement to use taxpayer funding for spill and flow programs of \$10 to 30 million.

Snake River Salmon Recovery Team - Bevan Plan

The CRA has prepared a summary of the Recovery Team plan (Bevan plan) along with our position on its elements (attachment 3). In the Bevan plan's two year development, CRA members were active by providing scientific information to the Team. State, Tribal, and the public had equal opportunity to participate.

In general, the Bevan plan has three elements that make it the best blueprint for salmon recovery. The plan is scientifically founded, comprehensive, covering each stage of the salmon's life cycle and, it was created through an open regional process, allowing technical peer review and comments.

The plan calls for measures including reform of hatchery practices that currently allow state fisheries agencies to produce and release large numbers of hatchery bred salmon that are often genetically inferior to wild strains. It recommends the end of the non-selective commercial harvest method of gill net fishing in the Columbia River, and the adoption of more selective fishing techniques that would decrease the chances of catching threatened wild salmon.

The plan recommends habitat enhancement using protection standards developed by PACFISH, FEMAT, and the Eastside Forests Scientific Society Panel. (The CRA disagrees with this approach and will discuss later)

The mainstem Columbia and Snake River system also will be impacted by the plan. It recommends, as a short term, immediate recovery measure, the region should rely on the transportation system that barges juvenile salmon around the dams and releases them closer to the ocean. A longer term measure may be varying the method used to collect and transport these smolts. It recommends adoption of the Northwest Power Council flow program and, on an experimental basis, the flows prescribed in the 1994-1998 Biological Opinion. Additional scientific research would determine future river flow operations.

But the plan cautioned against controversial reservoir drawdowns. A John Day reservoir drawdown was "considered and rejected as a significant recovery action" by the team. Other drawdown options were not seriously considered effective. The report said "In considering such an option, there should be reasonable evidence that smolt survival rates are significantly higher when the Snake River reservoirs are drawn down to river level than they are with other options." Current research has not shown that survival increases under a drawdown scenario.

In addition to the Bevan Plan's specific recommendations, it provides a framework or process for which future decisions can be made on a timely basis using the best available science. It will lead to better coordinated management of Columbia River fishery managers. We believe this measure is desperately needed.

Will the Bevan Plan Lead to Recovery?

Snake River threatened salmon are confronted with hazards throughout their life cycle (attachment 4). Natural and human caused events are pushing declines to extinction. The Columbia and Snake River basins are again experiencing a drought with Snake River flows only 50 percent of normal and Columbia River flows of 70 percent of normal. Also, poor ocean conditions are causing lower survival to both the threatened Snake River salmon and other runs from Oregon and Washington coastal streams (attachment 5).

However, despite these factors the CRA believes that we should pursue the Bevan Plan. It is the best "blueprint for survival" for these threatened salmon.

Next Step for Bevan Plan

As the Bevan Team acknowledges, much is still unknown regarding salmon and additional research is necessary. Therefore, implementation will likely require "adaptive management" allowing for mid-course corrections. The recovery team anticipated this action in its plan. As an example, CRA members believe the team was incorrect by recommending habitat protection standards developed by PACFISH, FEMAT, and the Eastside Forest Scientific Society Panel. We believe a more cost-effective approach for stream protection, one supported by user groups, is the new Oregon Forest Practices Act. We will pursue this approach in the plan's Habitat subcommittee.

Economics is an important element in the plan. What is the plan's cost? What elements provide a greater biological benefit for a given cost than other elements? Can the region afford the plan? As of this date these questions cannot be answered as cost and benefits estimates have not been provided. The CRA has advocated to the team that a cost-effectiveness analysis be performed on the plan (see Attachment 6 for previously prepared analysis). This information is required as it will allow the region to pursue the highest value salmon recovery measures first.

A critical next step to this plan and required for successful implementation is regional acceptability and support. This support is required by the Administration,

states, tribal entities, and regional communities, economic, and fish advocate groups. The plan's success is predicated by stakeholder involvement and participation. The exclusion of economic stakeholders in January 1994 by the Administration during the ESA Section 7 River flow operations lead several CRA members to seek participation using the Courts. If we are to avoid a repeat of the regional spotted owl train wreck, then the Administration must open their process. And it must be opened in a meaningful manner. An open process, encouraging stakeholder participation, would have provided additional scientific information on the recent federal agency decision to spill water at eight Columbia and Snake River dams. A program that we now believe, at best, spent \$11 million of taxpayer funds and, at worst, harmed the fish that we are attempting to save.

The CRA believes that we must proceed rapidly with final adoption of the Bevan plan. Without it, decisions such as the recent spill program and possible dictates by the federal court could become common place. A comprehensive plan that is scientific based is the direction the region should proceed. In an effort to expedite implementation, the CRA has prepared a listing of program elements that should begin immediately (attachment 7). These elements are compatible with the Bevan plan. We request your assistance.

Thank you for the opportunity to testify.

Attachment 1	CRA Membership List
Attachment 2	Columbia River Salmon Historical Trend
Attachment 3	Snake River Salmon Recovery Team Plan Summary
Attachment 4	Snake River Salmon Mortality
Attachment 5	West Coast Salmon Trends
Attachment 6	Cost Effectiveness Analysis
Attachment 7	FY 1995 Federal Appropriations



Columbia River Alliance

For Fish, Commerce and Communities

The Columbia River Alliance for Fish, Commerce and Communities (CRA) brings together diverse entities from throughout the Northwest in support of the philosophy for a balance of economic, agricultural, cultural and social needs of the Columbia River system.

MISSION

The strong multi-use river system must be maintained for the economic health of the region. Efforts to preserve naturally spawning salmon must be comprehensive and based on good science, least cost and economic reality. Regional commerce and naturally reproducing salmon are compatible.

CRA MEMBERSHIP LIST

Agricultural Interests

Agriculture Water Use Forum
 Columbia/Snake River Irrigators Assn.
 East Columbia Basin Irrigation District
 Eastern Oregon Irrigators Association
 Oregon Grains Commission
 Oregon Wheat Commission
 Pacific Grain Exporters
 Pacific Northwest Grain and Feed Assn.
 Pomeroy Grain Growers, Inc.
 Quincy Irrigation District
 Washington Wheat Commission

Community Groups

Clearwater Resource Coalition
 Oregon Water Coalition
 Washington State Grange

Industries

Direct Service Industries
 Industrial Customers of Northwest Utilities

Labor

Oregon AFL-CIO
 Washington Labor Council, AFL-CIO

Navigational Interests

American Waterways Operators, Inc.
 Brix Maritime
 Columbia River Towboat Association
 Pacific Northwest Waterways Association
 Pioneer Ports River Alliance
 Port of Portland

Forest Products

Northwest Forest Resource Council

Utilities

Benton County Public Utility District
 Benton Rural Electric Association
 Columbia River PUD
 Columbia Rural Electric Association
 Franklin County Public Utility District
 Grand Coulee Project Hydroelectric Authority
 Harney Electric Cooperative
 Inland Power and Light
 Okanogan PUD
 Pacific Northwest Generating Cooperative
 Ravalli County Electric Cooperative
 Umatilla Electric Cooperative

ECONOMIC VALUE

Multi-Use Columbia/Snake River System *

Navigation

- The Columbia River is the second largest navigational transportation system in the United States, after the Mississippi River. More export cargo moves through the river than any other port system on the West Coast.
- \$11.6 billion in commodities moved on the lower Columbia River deep draft channel in 1990 (\$5.8 billion in imports and \$5.8 billion in exports); 33 million tons of foreign cargo was transported on the Columbia in 1990.
- Another 17.7 million tons of cargo were barged in 1989 on the Columbia and Snake rivers between Portland/Vancouver and Lewiston, Idaho.
- Economic impacts of \$1 billion to the Port of Portland alone in river-commerce related payroll and activities; 12,000 jobs and \$316 million in payroll are directly associated with the port's marine facilities.
- Columbia River exports include \$3 billion in agricultural products and \$1.9 billion in forest products yearly; the Columbia handles 35% of all U.S. wheat exports.
- 2,200 ships carried cargo to and from lower Columbia ports in 1990; their crews spent \$6.5 million while in port.
- 14% of Oregon's gross product is generated through exports to foreign lands, the majority of that shipped from lower Columbia ports.
- Numerous ripple effects; \$21 million in banking and insurance business generated by maritime activity on the lower Columbia; 400 Portland-area firms rely on international trade via the Columbia.
- Navigation also plays a significant role in salmon run protection and enhancement; the U.S. Army Corps of Engineers transports more than 21 million migrating juvenile fish yearly by barge around Columbia and Snake River dams.

Irrigation and Agriculture

- More than \$5 billion worth of crops are produced on 8 million irrigated acres annually in the Northwest.
- Value of grain exports out of the Columbia River was more than \$1.9 million for 1989/90 marketing year.
- Irrigated land makes up 37% of Northwest farmland and produces nearly 75% of Northwest farm revenues.
- For every two agriculture-related jobs, one additional job is created in the local economy.

Energy

- Hydropower generated by BPA and other utilities supplies 62% of the region's average electricity consumption.
- Hydropower supplies 75% of the region's peak total electric supply, providing nearly 30,000 megawatts to meet high daily and winter peaks.
- BPA provides about one-half of the Northwest's electricity, a value of nearly \$2 billion in electric sales.
- BPA-generated electricity heats 46% of Northwest homes.
- Electricity needs equal to those of 12 cities the size of Seattle are served yearly by Columbia River firm hydropower production; replacing this power capability completely would require 15-20 coal-fired or nuclear plants.

Industry

- Members of the Direct Service Industries (those that purchase power directly from BPA) use Columbia River hydropower to produce 43% of the U.S. aluminum supply.
- DSIs account for 30% of BPA's total revenues.
- In 1990, the DSIs pumped nearly \$2.4 billion into the Pacific Northwest economy in electric power purchases; payroll, purchased goods and services, and taxes; efficient hydropower operations; and benefits from early completion of the hydropower system.
- Industrial Customers of Northwest Utilities, a group of 25 non-DSI companies relying largely on the Columbia River for power and transportation, employs more than 200,000 people in Oregon, Washington and Idaho, and contributes \$6 billion yearly to the regional economy.

Fish Harvest

- Estimated value to fishermen of gillnet commercial landings of salmon in 1990 was \$2.9 million for Columbia River zones 1-5 (mouth of river to Bonneville Dam) and \$2.3 million for zone 6 (tribal fishing zone for salmon and steelhead from Bonneville Dam to McNary Dam).
- Recreational and sport fishing for salmon was valued at \$27 million in 1989; \$10 million for steelhead.
- The 1990 commercial harvest was 140,000 for salmon in zones 1-5 and 117,000 for salmon and steelhead in the zone 6 tribal fishery.
- 873 commercial gillnet licenses were issued in Oregon/Washington in 1989 for non-treaty fishermen.

**Compiled by Columbia River Alliance for Fish & Commerce from reports of public agencies, trade organizations and other information sources.*

FIGURE 1. COMMERCIAL LANDINGS
COLUMBIA RIVER CHINOOK SALMON

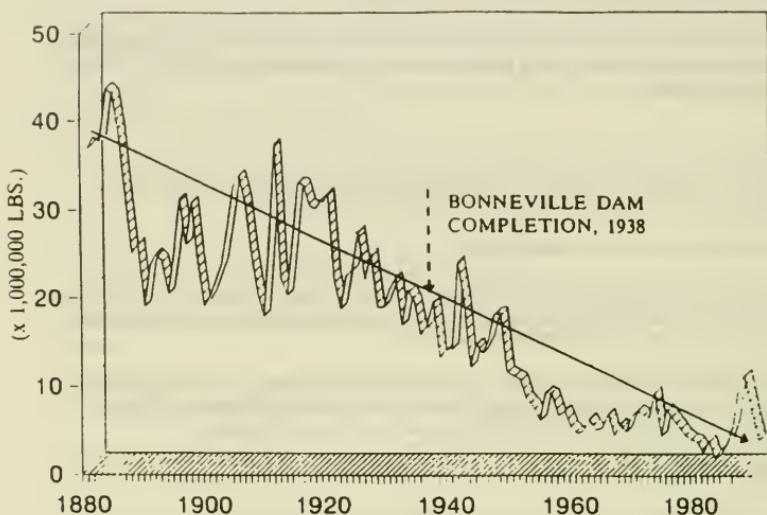


Figure 1. Commercial Landings Columbia River Chinook Salmon

➤ Columbia River Basin salmon runs have been declining for over a century. During the late 1880s and early 1900s, prior to the initial construction of the Columbia River dams, salmon runs were significantly reduced due to the effects of commercial fisheries.



Columbia River Alliance

For Fish, Commerce and Communities

Summary

**Snake River Salmon Recovery Team
Final Recommendations to the National Marine Fisheries Service
June 1994**

"No single factor is responsible for the full extent of the decline, and no single action will restore them. No 'magic bullet' or single-purpose fix exists to restore the salmon populations to their former levels of productivity and abundance...It is important to achieve recovery and ultimately to reap the social, cultural, and economic benefits of restored salmon populations. But it is also important to do so in an organized, scientifically based, and economically efficient manner."

— Snake River Salmon Recovery Team

Snake-Columbia River Salmon Management and Oversight:

"It is time to improve the management system for Columbia-Snake River anadromous fish...The problems have been well defined, and seem to us obvious: jurisdictional chaos, no one in charge, important decisions not based on science, and stifled science."

- The Team recommends formation of an independent, five-member Salmon Oversight Committee (SOC) to fill the critical decision-making void for science-based management.
- An organization is needed which will assume the task of properly managing the overall Columbia-Snake River Basin anadromous fish resources. The most appropriate agency for this responsibility is NMFS.

CRA Position - The CRA agrees with the Bevan Plan—the Salmon Oversight Committee is needed to promote decisions based on sound science. Due to the large number of independent Northwest fishery agencies, a single, coordinated management approach is needed.

Spawning and Rearing Habitat Improvement:

"The Salmon Recovery Team believes that now is the time to establish a unified position with respect to preventing further habitat degradation: any further exploitation of resources on public lands should be precluded unless it can be shown that no further harm will befall crucial salmon spawning and rearing habitats."

- The Team recommends the habitat protection standards developed by PACFISH, FEMAT, and the Eastside Forests Scientific Society Panel, which includes maintenance

of riparian buffer zones of specified dimensions along salmon spawning and rearing streams, related protection of subtending drainages, and elimination of increased sediment and water temperature impacts from road building, logging, and grazing on critical watersheds

CR4 Position: The CRA supports efforts to enhance habitat areas and our members have committed to assist. However, the Bevan Plan's moratorium on resource exploitation will only undermine meaningful efforts for habitat enhancement. Regulatory, broad approaches are not effective or efficient. Cooperative approaches with local landowners and land managers is the best approach.

Hatchery Improvements:

"The Recovery Team believes that hatchery objectives and operations must be critically examined and revised where necessary to assist, not impede, natural salmon productivity."

- The Team recommends that the management agencies and tribal authorities immediately undertake development of a coordinated regional plan and program for use of artificial propagation in support of recovery of ESA-listed salmon stocks and salmonid stocks considered at risk.
- The Team recommends required minimum health standards for hatchery smolt production, increased smolt viability standards not production numbers, and shifting production goals of selected hatcheries to conservation-directed objectives.

CR4 Position - The CRA agrees with the Bevan plan.

River Flow Augmentation:

"The region has been engaged in the political process of negotiating increasing water budget volumes since the first water budget was adopted by the Council in 1982...Because there is a lack of information on which to base a scientific decision on the size and timing of the water budget releases that will maximize salmon survival, the Team adopts the NPPC's water budget volumes included in the "Strategy for Salmon," 1992 as a starting point in determining the amounts of water needed."

- The Team suggests that the 1993 NPPC water budget—6.5 to 9.5 MAF sliding scale—be used as a starting point, but further the Team suggests that the increased water budget volumes developed by NMFS in the 1994-1998 Biological Opinion (10-11 MAF) be used over the next five years to test the changes in survival rates resulting from the proposed increase in water volumes. NMFS and the SOC should monitor the effectiveness.
- Within the Snake River, the Team recommends flow augmentation to improve in-river survival to the four primary smolt collection and transportation facilities.
- NMFS should formulate and conduct long-range smolt survival studies to determine within-year and between-year survivals for downstream migration.

CRA Position - CRA agrees with the NMFS position that better scientific studies on survival are needed. However, the CRA disagrees with exceeding 8 MAF.

Smolt Collection and Transportation:

"Collection and transportation should continue to be the primary means of getting spring, summer, and fall chinook salmon smolts from the upper dams in the Lower Snake River to a point downstream from Bonneville Dam until it can be determined if any other options will provide better chances for survival."

- The Team recommends that 1) measures should be evaluated and implemented to increase smolt collection rates for transportation (surface collectors, longer diversion screens to increase FGE); 2) additional smolt barges should be included within the transportation program to facilitate direct loading and reduce smolt handling/holding time, and 3) additional RD&D should be implemented for new lower river smolt release sites

CRA Position - CRA agrees with the Bevan Plan.

Snake River Drawdowns -Life-Cycle Model Analyses:

"Even with the uncertainties and gaps in the scientific understanding needed to construct valid biological models, the Team believes that a systematic accounting of the sensitivity of salmon survivals to alternative courses of recovery actions can be useful. The results of the model analyses help to put the survival improvements possible from changes in downstream passage in perspective."

- In recovery scenarios where smolt transportation was not used, the life-cycle models predicted reduced system survival.
- Drawdowns of the four Snake River reservoirs to near spillway crest resulted in fewer fish surviving to Bonneville Dam than in the base case, smolt transportation alternative
- Drawdown of the Snake River reservoirs to river level ("natural river" option) resulted in about the same number of smolts getting to Bonneville Dam as in the base case with transportation, but in the former all the fish were in-river migrants and in the base case most of the fish were transported. With no difference in viability between the two options, there is no benefit in drawing the reservoirs down.
- If additional studies conducted by NMFS indicate high smolt survival rates within Lower Granite Reservoir, then a physical drawdown test of Lower Granite Reservoir should not be implemented.

CRA Position - Reservoir drawdown lacks any scientific benefit for salmon yet costs could exceed \$5 billion and disrupt communities. The concept should be discarded in favor of more meaningful efforts.

John Day Pool Drawdown Proposal:

"The Team has considered, and rejected as a recommended recovery action, the current plans to drawdown John Day Reservoir from minimum irrigation pool (MIP) to MOP. The survival benefits of drawing down John Day Pool a few feet (maybe only two or three feet) from MIP to MOP are too small to be reliably determined."

- The Team believes the proposed John Day Drawdown will not be a significant recovery action for ESA-listed Snake River salmon because of the relatively small change in elevations (and thus velocities) from the current operation.
- Aside from any travel time benefits that might accrue from a drawdown, there may be adverse impacts to juvenile fish passage.

CRA Position - CRA agrees with the Bevan Plan.

Harvest:

"The Team concludes that modification of harvest methods for Snake River salmon and other weak natural stocks and reduction of harvest rates on fall chinook are vital to an early start for the recovery process... While the Team accepts with reservations the position of some fishery agencies that in-river fisheries can be very specifically controlled to meet harvest rate goals using gear, area, and time restrictions, this is true only for aggregated stocks. The present regime is geared to targets that do not protect listed stocks satisfactorily."

- The Team recommends that fishery managers establish an exploitation rate schedule over all fisheries affecting Snake River fall chinook. The allowable exploitation rate in any given year should be directly linked to measures of recent productivity and escapement. In the short term, the rate should be reduced from current levels.
- In order to permit savings from ocean and lower river harvests of Snake River fall chinook that are passed through to spawning areas, harvests in Zones 1-6 will have to be curtailed or shifted to terminal areas and/or selective gear.
- To minimize the economic hardship caused by harvest reduction measures, a buy-back program should be established to offer a fair price for purchase of licenses, boats, and gear.
- By 2002, the ocean troll fishery harvest of Snake River fall chinook should be reduced by 50% relative to recent years by gear and quota reduction, and all in-river fishing should be restricted to approved gear capable of live capture and release of listed species with maximum mortality rates specified by managing agencies. This is expected to require phasing out gill net fishing by that date.
- The US and Canada must reach agreement to reduce Canadian harvests of fall chinook off West-Vancouver Island.

CRA Position - The CRA agrees with the Bevan Plan, but supports immediate actions that will curtail commercial harvest of threatened salmon.

Natural Factors Affecting the Decline of Snake River Salmon:

"Since most salmon spend the longest portion of their life in the ocean, and most of their growth is derived from marine food sources, oceanic factors must be considered fully as possible in developing a salmon management and restoration program. Oceanic conditions may often override freshwater factors in determining trends and status of salmon populations."

- The dominance of oceanic factors in determining salmon abundance is suggested by the parallel trends in abundance in recent years for salmon stocks from many different freshwater environments along the Pacific Coast. Richards and Olsen (1993) demonstrated that Snake River spring chinook runs shared similar periods and trends of decline (from 1977-1991) with chinook salmon runs from the Lower Columbia River system, the Rogue River, several Washington coastal streams, and California's Klamath River. Recent comparisons of West Coast steelhead production showed similar downward production trends for hatchery and wild steelhead runs from Oregon, Washington, Idaho, and British Columbia.

"Marine mammal populations, especially harbor seals and California sea lions, are increasing on the West Coast...Marine mammal effects on salmon are potentially significant and represent an important factor in recovery."

- In 1990, an increase in marine mammal damage on spring/summer chinook, from a few percent per year to an average of 19.2%, was noted at Lower Granite Dam on the Snake River. This damage was thought to be attributable to harbor seals. This information has led some researchers to speculate that losses of Snake River salmon through marine mammal predation may be equal to the combined sport and commercial harvest.

CRA Position - The CRA believes that better information on ocean mortality is needed and this is a major cause of salmon decline. Marine mammal population control must be more aggressive.

Recovery Plan Cost and Cost-Effectiveness:

Note: The Bevan plan does not estimate the cost of the plan or the relative cost-effectiveness of its elements.

CRA Position - The next step for NMFS and the other federal agencies is to estimate the cost of the individual elements and to determine the cost-effectiveness. This information will provide decision makers a priority listing of elements. The ability of our region to continue to pay for salmon enhancement is a concern. With 1994 costs of \$350 million, our expectation is that this plan could replace ongoing efforts and reduce or minimize future costs.

CRA, June 14, 1994

CRA issue briefing paper

June, 1994

It's time to be factual—Dams don't kill 95% of the salmon

A Closer Look at Salmon Mortality

Salmon lead a perilous life, with some Snake River Spring Chinook traveling almost 900 miles from central Idaho to the Pacific Ocean, spending years in the ocean and finally the lucky ones return to points of origin. Anticipating high mortality, a female salmon may lay 4500 eggs, with the objective of returning only two spawning adults. Mortality occurs through several life stages of the Snake River salmon migration path. Some of this mortality is due to natural system mortality and some is related to human-caused mortality, such as spawning habitat impacts, dam passage and harvest of some stocks. In almost all life stages, natural and human-caused mortality impacts are difficult to separate.

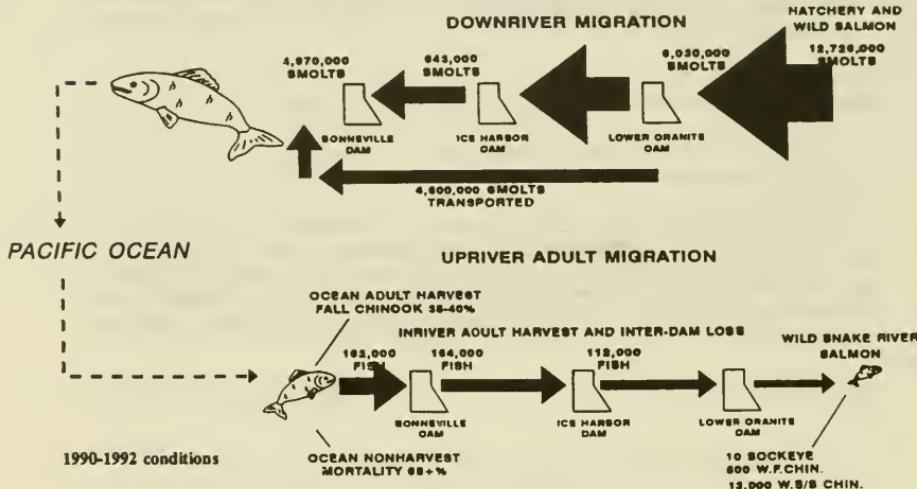
Rearing sites to Lower Granite Reservoir: Percentage of total mortality = 25% (A.E.)*

From the juvenile rearing sites in Idaho to the head waters of the Lower Granite Reservoir a

juvenile salmon may travel up to 400 miles. Biologists estimate only about 50 percent of hatchery and wild fish survive this first stage.

Lower Granite Reservoir to Bonneville Dam: Percentage of total mortality = 20% (A.E.)*

Survival rates through the Lower Granite Reservoir are relatively high, estimates to be 95 percent or greater, as recorded in reservoir passage experiments conducted by a joint University of Washington/National Marine Fisheries Service (NMFS) research team. The majority of Snake River salmon do not pass directly through the Snake and Columbia River hydroelectric dams and reservoirs. Most salmon are transported in specially designed barges from collection sites at Lower Granite, Little Goose, Lower Monumental and McNary projects to release sites below Bonneville Dam—as many as 85 percent in recent years.



"How can dams kill 95 percent of juvenile salmon if 85 percent of them are transported alive?"

Fish collection and transportation cause less than 1 percent mortality for salmon and steelhead. The overall effectiveness of the smolt transportation program has been evaluated by NMFS for several years. NMFS scientists estimate that adult survival rates for transported fish are about 60 to 150 percent higher than for fish that pass directly through the hydroelectric dams and reservoirs. Although there is some conjecture over a possible latent mortality of transported fish, all recent transportation studies indicate a beneficial effect for transporting juvenile salmon.

Below Bonneville Dam, the Estuary and the Ocean:
Percentage of total mortality = 25% (A.E.)*

From below Bonneville Dam and through the estuary, both transported and non-transported fish are exposed to high levels of predation and other mortality factors. After Bonneville dam it is difficult to monitor juvenile salmon, however, some analyses suggest about a 40 percent mortality through this river reach.

In the ocean, mortality is high for all Snake River salmon stocks. Of those juvenile fish that enter the Pacific Ocean, only 1 to 5 percent will survive to return as adults headed back up the Columbia River. Most of the ocean mortality is believed to occur during the early months of ocean entry.

It has become increasingly evident that ocean ecological and environmental conditions play a major role in determining ocean survival, for both wild and hatchery stocks. For example, similar population trends have been observed between Snake River spring chinook and other West Coast chinook populations of both dammed and undammed river systems. The poor returns of chinook salmon in the early 1990s are to a large extent due to poor ocean conditions, whether or not the fish encountered dams.

Snake River spring chinook are estimated to have little direct and secondary mortality due to open ocean fishing, about a 1-3 percent mortality rate. But under historical fisheries harvest policies, adult fall chinook mortality was approximately 35 to 40 percent, with most harvest occurring in Canadian waters.

Adult Up-River Passage Survival:

Percentage of total mortality = 10% (A.E.)*

Once in the river, returning adult chinook salmon will experience mortality from natural causes, dam passage, and harvest impacts. Adult up-river passage mortality is estimated to average about 5 percent per project through the Columbia/Snake river system, due to both natural and man-made causes. For Snake River fall chinook, about 28 percent are harvested as "incidental take" within the Indian and non-Indian commercial fisheries.

Pre-Spawning Stage:

Percentage of total mortality = 15% (A.E.)*

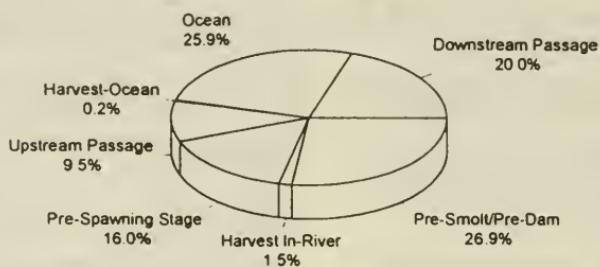
The final mortality stage occurs as adults leave the upper dam, Lower Granite and make their final ascent to the spawning grounds. Here survival rate estimates vary greatly, ranging from between 60 to 85 percent. Among the different salmon runs, spring chinook are estimated to have the lowest pre-spawning survival rate as they travel almost 400 miles in this final stage.

* A.E.

What is Adult Equivalent?

Snake River salmon mortality is best described by comparing mortality across different life stages in equivalent terms. To do this, the value of a fish within certain life-stages must be "calibrated" to its expected value as an adult spawner. For example, given the life-cycle survival rate information described above, it is apparent that a large number of smolts entering the Lower Snake River system (above Lower Granite Dam) is required to produce one returning adult spawner. But in a later life stage, a smaller number of fish is required to produce one returning adult spawner.

Snake River Salmon Life-Cycle Mortality
Spring Chinook Estimated Adult Equivalent Mortality



ATTACHMENT 5

FIGURE 2.

SNAKE RIVER SALMON
PRODUCTION TRENDS ARE
SIMILAR TO WEST COAST
TRENDS AND OTHER BASINS

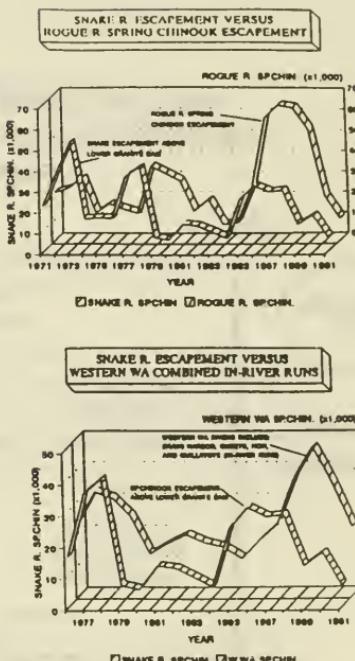
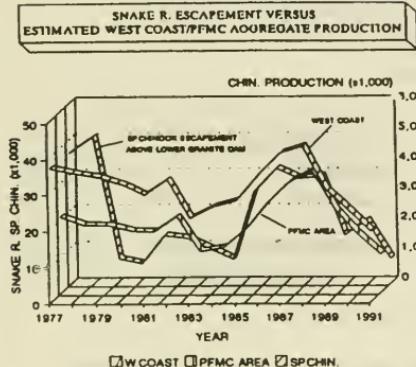


Figure 2. Snake River Salmon Production Trends Are Similar to West Coast Trends and Other Basins

- During the past decade, Snake River spring chinook salmon runs have generally followed production trends similar to that of overall West Coast chinook production trends. Also, Snake River spring chinook production trends generally match trends within other major river systems. This similarity is apparent when Snake River production is directly compared to the Rogue River (south of the Columbia River) and the combined western Washington rivers (north of the Columbia River).

**FIGURE 6. COST-EFFECTIVENESS ANALYSIS
RECOVERY MEASURE MARGINAL BENEFITS/COSTS
(QUADRANT RANKS 1,2,3,4)**

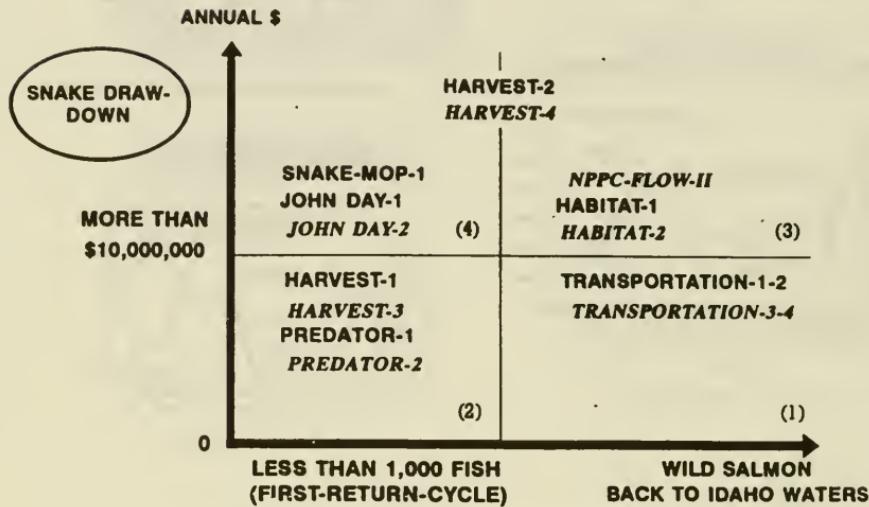


Figure 6. Cost-Effectiveness Analysis: Recovery Measure Marginal Benefit/Costs

- Potential recovery measure fish benefits and economic costs have been compared using standard life-cycle model assumptions and measure costs derived from the NMFS Economics Technical Committee, the Corps of Engineers, and Bonneville. This analysis suggests that the most cost-effective measures—highest level of fish benefits for the dollars spent—are smolt transportation improvements, in-river harvest reductions, predator control actions, and other measures. The least cost-effective measures are reservoir drawdowns.



Columbia River Alliance

For Fish, Commerce and Communities

FY 1995 FEDERAL APPROPRIATIONS

JUNE 13, 1994

"Federal Appropriations needed to accelerate programs to aid Pacific Northwest threatened salmon"

The CRA believes that it is important to proceed with activities that can aid salmon and request the following programs in the 1995 Federal Appropriations. In each of the programs listed below, we will describe their consistency with the National Marine Fisheries Service (NMFS) Recovery Team Plan ("April, 1994, Final Recommendations, Summary") and the Northwest Power Planning Council's Strategy for Salmon ("October, 1992, Volume II"). The intent of our request is to expedite elements which are generally included within the two regional plans and to prioritize limited funding and staff resources toward more meaningful and scientific supported activities.

I. HATCHERY AND HARVEST REFORM

Background - Over \$35 million each year is authorized by Congress to construct, operate and maintain more than 60 hatchery facilities on the Columbia and Snake River system. These include funding of NMFS Mitchell Act, Corps of Engineers Lower Snake Compensation, and BPA. A variety of federal, state, tribal, and private entities operate these hatcheries. However, the system of hatcheries has come under question regarding continued viability as a result of diminishing returns of both wild and hatchery fish and concern for negative interaction. At the present time, a selective harvest cannot be initiated because a hatchery salmon and an Endangered Species Act threatened Snake River Chinook salmon cannot be distinguished from each other. A reform package is required and will consist of the following elements that will be used to ensure protection and enhancement of threatened salmon stocks.

1995 Federal Appropriations Recommendations -

National Marine Fisheries Service, Fish and Wildlife Service, Army Corps of Engineers, Bonneville Power Administration, and any state or private entities that receive federal hatchery funds -

- 1. Effective immediately, mark all hatchery released salmon produced for harvest in the Columbia Basin so that selective fishing methods can be employed.***

2. *Develop prior to FY 1996 Appropriations a listing with scientific rationale of federally funded fish hatcheries in the pacific northwest that support the preservation of Endangered Species Act listed wild salmon runs and other weak, wild salmon runs. Listing should include modifications required to improve quality of hatchery reared salmon. Hatcheries to be closed should be indicated.*

3. *Pacific northwest federally funded hatcheries shall provide salmon for federal agency supported scientific studies, especially studies for evaluating survival from mitigation and enhancement activities.*

Consistency with NMFS Recovery Team (Bevan) Plan -

1) Marking Hatchery Fish--"The Team recommends that harvest management should be changed to reduce harvest rates and capacity for all listed stocks...By the year 2, the only harvest that should be allowed in any Columbia River shery should be selective with live release capability...." pg 20, Team Final Recom., Summary

2) Listing of hatcheries for continued operation and funding--"The Recovery Team believes that hatchery objectives and operations must be critically examined and revised where necessary to assist, not impede, natural salmon productivity. Some hatchery operations may need to be shifted to conservation objectives instead of concentrating on production. The reason for this is that hatchery operations have historically been highly uncoordinated. They are authorized under agencies (federal, state, and tribal)." pg 14, Team Final Recomm., Summary

3) Hatchery fish availability for scientific studies--"The absence of supporting scientific information was a recurring problem the Team faced in establishing the strategies and specific tasks for recovery. For downstream passage, continuation and expansion of the current survival studies is mandatory." pg 17, Team Final Recomm., Summary

Consistency with NPPC Strategy for Salmon -

1) Marking Hatchery Fish--"Mark all hatchery-reared chinook by 1995 to facilitate selective harvest in the future, pursuant to findings from the marking feasibility study." pg 61, Strategy for Salmon, Vol. II

2) Listing of Hatcheries for Continued Operation and Funding--"Bonneville - Beginning in 1993, fund ongoing independent audits of hatchery performance in consultation with Integrated Hatchery Operations Team... Include recommendations for improving performance and for modifying or terminating hatchery programs." pg 60, Strategy for Salmon Vol. II

3) Hatchery fish availability for scientific studies--"Fishery Managers - Make available from hatcheries or other appropriate sources the required numbers of juvenile salmon necessary to conduct the flow, travel time and survival studies called for in Section 3.6F3-3.6F5." pg 35, Strategy for Salmon Vol II

II. WATER DIVERSION SCREENING

Background - 1994 Mitchell Act funding provided \$4.7 million for installation and maintenance of water diversion fish screens. This funding is not included in the 1995 budget. Current plans call for screening 172 diversions in 1995 and 1996.

1995 Federal Appropriations Recommendations -

National Marine Fisheries Service - Fund \$6.0 million for installation and maintenance of water diversion fish screening devices under Mitchell Act.

Consistency with NMFS Recovery Team (Bevan) Plan -

"Screening: Irrigation withdrawals should be effectively screened to prevent loss of juvenile and adult fish." pg V-11, October 1993, Recovery Team Draft Plan

Consistency with NPPC Strategy for Salmon -

"There is an immediate need to accelerate the installation of new facilities on unscreened diversions and repair or upgrade older facilities." pg 76, Strategy for Salmon, Vol II

III. SMOLT TRANSPORTATION PROGRAM

Background - The U.S. Army Corps of Engineers operates a juvenile salmon transportation or barging program. The Corps is investigating program enhancements through its System Configuration Study (SCS); however, they are potentially several years from implementation. At recent regional public hearings on the SCS, the public provided strong support for the barging program and expedited implementation of barging improvements. In the Corps SCS Phase I report, "Currently, there are not enough barges available to load collected smolts directly into awaiting barges...After evaluating three options, it was determined that an additional four barges of 75,000-pound capacity would satisfy a direct-loading target." pg-6-40, SCS, April 1994

1995 Federal Appropriations Recommendations -

1. Army Corps of Engineers - On an expedited basis, Fund \$12 million to acquire four additional barges for juvenile salmon transportation. Implement strategy that releases transported salmon closer to estuary.

2. Army Corps of Engineers - Fund \$2 Million for expedited investigation of the feasibility of surface fish collector facility or extended-length screens at Lower Granite Dam and net pen transportation prototype for use below Bonneville Dam.

Consistency with NMFS Recovery Team (Bevan) Plan -

"In the Team's view improved smolt collection at the Snake River dams and transport to the lower Columbia River is the option that must be used until better options are developed...barges should be designed to lower stress, barge exits should be modified to allow dispersed release, research should be conducted to evaluate various release sites in the lower Columbia." pg 18, Team Final Recomm., Summary

Consistency with NPPC Strategy for Salmon -

"On an expedited basis, improve salmon transportation by upgrading facilities and improving operations. Improvements should include ... minimize fish densities,... developing smolt release strategies, including dispersing fish to minimize predation. Immediately evaluate ... alternative release sites downstream. Expedite funding for a preliminary evaluation of a) the feasibility of constructing and operating alternative fish bypass and collection facilities at the upstream end of Lower Granite Reservoir, ... c) the feasibility and benefits of net pens to increase survival of transported fish." pg 40, Strategy for Salmon Vol II

IV. JOHN DAY RESERVOIR DRAWDOWN

Background - Northwest electric ratepayers, through the Bonneville Power Administration, are funding the Corps of Engineers to conduct studies and Advanced Planning and Design (AP&D) activities for a John Day Reservoir drawdown. According to the Corps, 1994 through 1999 AP&D studies are estimated to cost about \$12 million. A drawdown from 263 ft elevation to 257 ft elevation is the proposal under consideration with studies requested by the Northwest Power Planning Council in its Strategy for Salmon. Studies were conducted under the Corps' System Configuration Study (SCS). The plan lacks scientific basis, is high cost, and negatively impacts resident fish, wildlife, and area communities. The plan was discarded by the NMFS Recovery Team. At recent regional public meetings, no individual supported any form of drawdown of the John Day Reservoir.

1995 Federal Appropriations Recommendations -

Army Corps of Engineers - No action or funding is requested as no scientific and public support exists. No Advanced Planning and Design Activities should be funded or conducted. Remaining FY 1994 funds should be shifted for high priority activities such as fish marking program and improved smolt transportation as described above.

Consistency with NMFS Recovery Team (Bevan) Plan -

"The Team has considered and rejected as a significant recovery action, the current plans to draw down John Day Reservoir below minimum irrigation pool." pg 18, Team Final Recomm., Summary

Comments by the Corps of Engineers (System Configuration Study) -

"Potential effects of the operation on survival of Snake River stocks is minimal...due to transportation. The vast majority of juveniles from the Snake River would not be affected by actions in the lower Columbia River." Corps SCS Review Phase I

Comments by Harza Engineering (NPPC Consultant) -

"The principal flaw of a proposed drawdown at John Day is our inability to quantify the benefits to anadromous salmonids...While benefits to salmonids are debatable, impacts to wildlife are not...Harza does not endorse the five-foot John Day drawdown." April 1994 Harza Review of Reservoir Drawdown Study

V. SNAKE RIVER DRAWDOWN - BIOLOGICAL DRAWDOWN TEST

Background - In March, 1992, a one-month "physical" drawdown test was conducted of the Lower Granite and Little Goose Reservoirs. A "biological" test is now being considered by the Corps beginning in 1996 at Lower Granite Reservoir. The test would could be conducted for up to four years for two month durations. Drafting and refill limitations would extend the drawdown period to approximately three and one-half months. The Corps estimates the test would cost \$113 million (four-year duration). River navigation to Lewiston and Clarkston would be eliminated during this period. Although the test would simulate spillway crest drawdown conditions (Idaho Plan), the Corps discarded the four-dam spillway crest drawdown option from long term operation in its System Configuration Study (preliminary findings phase I). Therefore, the biological test considered does not provide information for future reservoir operation. The test is simply not as scientific as investigations (Iwamoto, Skalski, Williams Flow/Survival Study) on river flow levels and fish survival that are underway in the Lower Granite Reservoir reach. These baseline studies will be completed in 1995 or later. To date, no qualified scientists have supported reservoir

drawdowns as a means to enhance threatened salmon. The NMFS Recovery Team stated these baseline tests must be conducted prior to any drawdown testing. Further drawdown testing must be a credible biological experiment. At recent regional meeting, the public expressed strong opposition for any drawdown test.

1995 Federal Appropriations Recommendations -

National Marine Fisheries Service and Army Corps of Engineers - Funding should be provided for continued baseline flow survival studies (Iwamoto, Skalski, Williams Study). 1995 funding for Snake River drawdown planning and test drawdowns should not be provided as no scientific or public support exists. Funds and Agency Staff can be better used for priority salmon enhancement proposals.

VI. ADULT PASSAGE SYSTEM IMPROVEMENTS

Background - The Corps is examining a variety of improvements that would improve survival of upstream migrating adult salmon past hydroelectric dams in the Columbia and Snake rivers. These include modifying fish ladders, attraction water, entrances, exists, and others.

Army Corps of Engineers - Provide listing of adult salmon passage system improvements in the Columbia and Snake River prior to FY 1996 Appropriations.

Consistency with NMFS Recovery Team (Bevan) Plan -

"To improve upstream passage conditions, the Team recommends changes to adult fishways at dams and dam operations." pg 20, Team Final Recomm., Summary

Consistency with NPPC Strategy for Salmon -

"Continue to evaluate all mainstem adult passage facilities, evaluate the need for new facilities, and make facility improvements as necessary". pg 41, Strategy for Salmon, Vol II

VII. HABITAT ENHANCEMENTS

Background - Both regional salmon recovery plans include measures for improving spawning and rearing habitat. The Soil Conservation Service of the Department of Agriculture is established as an agency that can work cooperatively with land owners to enhance habitat. The Northwest Power Council has requested augmented funding for the Soil Conservation Service. The CRA supports this effort.

1995 Federal Appropriations Recommendations -

Soil Conservation Service - Fund \$8 million for providing technical and financial assistance for pacific northwest salmon habitat protection efforts.

VIII. PREDATION

Background - Both squawfish and marine mammals are major predators for both juvenile and adult salmon. BPA has been operating a squawfish management program with high management overheads providing only limited effectiveness. The Marine Mammal Act has been recently revised allowing for some selective reductions of populations.

1995 Federal Appropriations Recommendations -

Bonneville Power Administration - Implement a revised squawfish management program that more effectively and efficiently reduces salmon predation.

National Marine Fisheries Service - Fund a one year study to determine level of marine mammal predation on Columbia River salmon, and develop a plan in FY 1996 to minimize marine mammal predatory impacts on salmon.

Consistency with NMFS Recovery Team (Bevan) Plan - "The existing squawfish control program should be revised to progressively reduce predation on smolts...Impacts from bird and marine mammal predation should be assessed, and control methods should be designed." pg 21, Team Final Recomm., Summary

Consistency with NPPC Strategy for Salmon - "Reduce squawfish population by about 20 percent ... in the Columbia and Snake rivers." pg 38, Strategy for Salmon Vol II .

IX. SALMON OVERSIGHT COMMITTEE

Background - Differing agency and consultant scientific views have resulted in reduced salmon enhancement efforts. The National Marine Fisheries Service Recovery Team became aware of this problem during the two year development of its salmon recovery plan and recommended formation of an independent scientific team to oversee regional efforts.

1995 Federal Appropriations Recommendations -

National Marine Fisheries Service - Form a five-member scientific salmon oversight committee to be responsible for ensuring that the Columbia-Snake salmon enhancement efforts work effectively, priorities are set, and that decisions are made using relevant science. The initial team (Salmon Oversight Committee) shall be

comprised of existing members of the Snake River Salmon Recovery Team.

Consistency with NMFS Recovery Team (Bevan) Plan - "The Team also believes that an impartial, independent, science-based group should be responsible for ensuring that the Columbia-Snake River Basin management system for anadromous fish works effectively in setting priorities, ensuring a scientific basis for decisions, and promoting relevant science. The Team recommends that an independent five-member oversight committee - called the Salmon Oversight Committee - be formed to fill this critical decision-making void." pg 11, Team Final Recomm., Summary



TESTIMONY OF

F. LORRAINE BODI, CO-DIRECTOR
AMERICAN RIVERS NORTHWEST OFFICE

ON BEHALF OF AMERICAN RIVERS, INC.
AND SAVE OUR WILD SALMON

BEFORE THE HOUSE COMMITTEE
ON MERCHANT MARINE AND FISHERIES

June 30, 1994.

NORTHWEST REGIONAL OFFICE
4518 UNIVERSITY WAY, N.E.
SUITE 312
SEATTLE, WA 98105
206-545-7133
206-545-7144 (FAX)

printed on 100% post-consumer recycled paper
with soy-based inks

Good morning, Chairman Studds and members of the Committee. Thank you for the opportunity to testify today on the subject of salmon recovery in the Columbia Basin.

My name is Lorraine Bodi and I am co-director of the Northwest office of American Rivers, a national conservation group dedicated to the protection of river ecosystems. In the Pacific Northwest, American Rivers focuses on restoration of our depleted salmon runs. I am also chair of Save Our Wild Salmon (SOS), a coalition of forty-two national, regional, and local conservation and fishing groups and salmon-based businesses working together to restore endangered salmon runs to harvestable levels.

My personal involvement in Northwest salmon issues dates back over fifteen years. For thirteen of those years, I represented the National Marine Fisheries Service (NMFS) in its efforts to protect salmon habitat. In the late 1970s, I worked on the first review of Columbia Basin salmon under the Endangered Species Act. In 1980, I was a member of the "ad hoc work group" of fishery and utility interests, a group that drafted the fish and wildlife provisions adopted as part of the Northwest Power Act.

Through the 1980s and early 1990s, I represented NMFS in its efforts to obtain fish passage improvements -- improved flows, spills, and bypass systems -- at individual dams in the Columbia Basin, and in its efforts to prevent the initiation of a new barging program in the mid-Columbia below Grand Coulee dam. I have negotiated several settlements of fish and power conflicts in the Columbia and other river systems. Where settlement has not been possible, I have litigated the science, policy, and law surrounding fish passage and restoration in the Columbia Basin.

From this base of experience, I have developed a number of views on what it will take to restore Columbia Basin salmon. Today, more urgently than ever before, the answer is action. We must finally stop arguing over the problems and start solving them. We must accept the fact that protecting the salmon will mean changes in river operations, and start figuring out creative ways to make those changes. The longer we wait, the more painful salmon recovery will be, as we postpone the ultimate day of reckoning.

The Committee has posed three questions about Columbia Basin salmon recovery, all closely related. Rather than address them one by one, I would like to respond by making five points that together cover the answers.

- First, a recovery plan for the salmon is long overdue.

- Second, a salmon recovery plan must be an action plan, a cookbook of measures and timetables leading to recovery.
- Third, a recovery plan must involve state fishery agencies and affected Indian tribes and build on the results of Idaho v. NMFS.
- Fourth, a salmon recovery plan must be implemented in full, not selectively.
- Fifth, a recovery plan must focus on protection of the river ecosystem, on migration of fish in the river.

A Recovery Plan for the Salmon Is Long Overdue

The controversies that confound salmon recovery in the Columbia Basin are not new. Looking back almost fifteen years ago, just before the passage of the Northwest Power Act, the political, legal, and scientific debates in the region were very much the same as they are today:

- The National Marine Fisheries Service was conducting a status review under the Endangered Species Act for all upper

Columbia and Snake River salmon stocks because of concern over their declining numbers;

- Inriver fisheries were closed and other fisheries were being curtailed because of declining salmon runs;
- Fishery agencies and tribes and their supporters were recommending specific flows to speed juvenile fish migration to the ocean;
- Dam operators and their supporters were urging more studies and use of barging for fish passage instead of flow improvements.

The Northwest Power Act of 1980 was a commendable effort to break the gridlock and get salmon recovery underway. The Act states that Columbia Basin salmon are "of significant importance to the social and economic well-being of the Pacific Northwest and the Nation" and so directs their "protection, mitigation, and enhancement."

The primary focus of the Act was the dams, because salmon "are dependent on suitable environmental conditions substantially obtainable from the management and operation of the Federal

Columbia River Power system and other power generating facilities on the Columbia River and its tributaries."

Specifically, the Act called for a system-wide Columbia Basin Fish and Wildlife Program. It directed the Program to include flows of sufficient quality and quantity to improve fish migration and survival. It called for action based on what we know, rather than delay until we know everything. In cases of technical disagreement, it mandated deference to the recommendations of fishery agencies and tribes.

In short, the Columbia Basin Fish and Wildlife Program first developed in 1982 was supposed to be the region's recovery plan for Columbia Basin salmon. It looked so promising that NMFS suspended its review of salmon under the Endangered Species Act.

But the promise of the Act came up against deep resistance to change among the dam operators and their supporters. The Columbia Basin Fish and Wildlife Program met the same call for more studies and continued fish barging that we hear today.

The last fifteen years have been spent doing more studies and dodging the need to modify the operation of the Columbia Basin's dams and reservoirs. Meanwhile, Snake River salmon runs have been listed under the Endangered Species Act, productive fisheries have been closed from California to Alaska, and this

year's returning salmon are at the lowest levels ever seen. We are, quite literally, studying and debating the fish to death. A real recovery plan for the salmon is urgently needed and long overdue.

A Recovery Plan Must Be an Action Plan.

The Northwest Power Planning Council's Strategy for Salmon and the Snake River Recovery Team's Recommendations are starting points for developing a recovery plan for Columbia Basin salmon. Both are only framework documents. They outline the table of contents for a recovery plan, covering all aspects of the salmon life cycle, but fail to fill in many critical details.

In lieu of specific actions leading to recovery, the Recovery Team has proposed numerous studies, new committees, and future procedures to develop specific actions. While these might all be commendable if salmon were not on the verge of extinction, they simply do not constitute a recovery plan.

In the words of one scientific reviewer of the draft Recovery Team recommendations:

[I]t is not a recovery plan at all. When one strips away the background material and documentation, all that is left is the recommendation that more committees and research are

needed so that essential plans can be made at some unspecified time in the future. . . . The time to bite the bullet is now! We need decisions now, and while they may not be perfect (hopefully they can be corrected as we go along), at least that is better than trying to do it when the runs are down to six fish or less. (Peer Review Comments of Dr. Carl B. Schreck)

Many other reviewers echoed these same concerns. Verbatim excerpts from peer review commenters are appended to the end of my testimony.

To meet the needs of the salmon and the ESA, a recovery plan must be an action plan -- detailed and specific. Under the ESA, a recovery plan must include site-specific management actions for conservation and survival; objective, measurable criteria for recovery and removal from listing; and time and cost estimates for intermediate and final measures. These are not impossible tasks, but they do pose difficult choices, particularly when it comes to changing existing hydropower operations.

The difficult choices facing the hydropower system continue to thwart a regional solution. Because 90% of the human-caused mortality to Snake River salmon is caused by the dams, we must fix the dams to recover the fish. All the sacrifices made by our

fisheries and fishing communities, and all of our other mitigation efforts will be in vain if we do not fix the dams.

This unavoidable fact is the reason the Power Council's strategy for Salmon and the Recovery Team's recommendations are both incomplete. As the Power Council readily admits, implementation of only existing measures will not recover endangered salmon runs, and additional measures, such as reservoir drawdown, are absolutely necessary.

Life-cycle computer modeling conducted by the Columbia Basin Fish and Wildlife Authority State and Tribal Analytical Team -- and presented to the Recovery Team for their use -- confirms that implementation of only the measures in the Recovery Team's recommendations will not recover endangered salmon runs.

The much repeated claim that we have no science to support and identify fish passage measures, to chart a path to recovery of the salmon, is false. Columbia Basin salmon may well be the most studied fish in the country -- the volumes of historical data, field studies, and monitoring results on these fish would fill an entire library.

It takes some effort to get past the political science and down to the real science in the Columbia Basin, to get past the rhetoric on all sides. But the science is there if you look for

it. The science reveals two central conclusions -- that fish need better, faster flows for recovery and that barging fish has not led to their recovery.

Like all information drawn from natural science, these conclusions are subject to some degree of uncertainty. Nevertheless, if we conduct another 20 years of study, there will still be uncertainty and more studies to be done.

We are studying the fish to death, using good intentions and the need for absolutely conclusive science as cover to avoid the difficult decisions fishery agencies and tribes have been urging on us for a decade and a half. Like the tobacco industry claiming that there is no scientific proof linking smoking and lung cancer, the dam operators and their supporters claim we have insufficient scientific proof that fish need improved river flows.

By their measure, we will have proof the fish are extinct before we have proof they need better river flows. We are charting a terrible path for the region and for the fish.

Given the dire conditions of our fish runs, it is scientifically, biologically, politically, and legally irresponsible to further delay actions to recover the salmon. The risk of inaction, in very short order, is extinction.

A Recovery Plan Should Build on the
Results of Idaho v. NMFS.

In the loud clamor over salmon science, it is easy to overlook the fact that federal, state, and tribal fishery scientists have spoken with one voice, consistently recommending improved fish passage in the Columbia Basin for many years. These scientists are charged with interpreting the best available scientific information and translating it into specific measures to improve the survival of spawning and migrating fish. They are charged by law with doing what is best for the future of fish runs and fisheries, erring on the side of the fish.

Although they do not lobby decision makers or court the media, the analysis and conclusions of agency and tribal scientists should be sought out and given substantial deference in the debate over salmon recovery.

Fishery agency and tribal scientists prepared detailed peer review comments on the draft Recovery Team recommendations. Verbatim excerpts from these comments are appended to my testimony. In general, these scientists were critical of the incomplete and inconclusive nature of the Team's recommendations.

For example, the State and Tribal Analytical Team, on the basis of its life cycle modeling for various recovery scenarios, stated:

[T]he recovery measures were evaluated within the narrow confines of economic and social constraints and not on the basis of biological requirements for recovery and physical constraints of the hydrosystem.

* * * * *

The Recovery Team did not evaluate alternative management actions with the goal of increasing instream survival of migrating juvenile salmon. For example, there were no management scenarios which evaluated the combination of drawdown in the Snake River and flow augmentation in the Columbia River.

The Fish Passage Center, which oversees fish migration monitoring and evaluation for federal and state fishery agencies and Indian tribes, had similar comments:

The most serious limitation of the Plan is that it does not include any analysis which indicates that the listed stocks will rebuild and recover with implementation of the Plan.

Because of the absence of an open scientific debate over salmon recovery, the states and tribes have found themselves in federal court, along with conservation and fishing groups. In Idaho v. NMFS, a case where the States of Idaho, Oregon, and Alaska, and four Indian Tribes challenged the federal biological opinion for the hydro system, Judge Malcolm Marsh commented that "the underlying root of the litigation problem is the feeling of these parties that the federal government is simply not listening to them." He overturned the biological opinion finding that "the ESA does impose substantive obligations with respect to an agency's consideration of significant information and data from well-qualified scientists such as the fishery biologists from the states and the tribes."

After reviewing the record and affidavits in the case and personally questioning the parties' scientists under oath, Judge Marsh found that "Instead of looking for what can be done to protect the species from jeopardy, NMFS and the action agencies have narrowly focussed their attention on what the establishment is capable of handling with minimal disruption."

To address this legal shortcoming, the Judge set in motion a series of discussions between the federal government on the one hand and the states and tribes on the other.

These discussions are now underway. Although progress has been disappointingly slow, the Marsh discussions should result in a new set of measures designed to avoid jeopardy to salmon migrating through the hydrosystem. As Judge Marsh himself explained, there is no bright-line where avoiding jeopardy ends, and recovery begins. Consequently, the outcome of the discussions in Idaho v. NMFS will be a necessary component of the NMFS recovery plan for the Columbia Basin.

A Recovery Plan Must Be Implemented in Full.

While it may seem obvious, a recovery plan for Columbia Basin salmon must be implemented in full. If it is to work, a recovery plan cannot be a cafeteria menu, from which we pick and choose, implementing the easy ones and ignoring the "major overhaul" called for by Judge Marsh.

If history is any guide, however, there is grave cause for concern about the potential for full implementation of flow augmentation and reservoir drawdown measures -- even though these are both called for in general terms in the Strategy for Salmon and the Recovery Team's recommendations. For example, the original Water Budget developed by the Power Council in 1982 was never fully implemented in the Snake River until after ESA petitions were filed, just a few years ago.

Even today, implementation of the Council's Strategy for Salmon remains highly uneven. The Bonneville Power Administration's selective use of the Strategy for Salmon to determine its funding and operational priorities is still being debated.

Getting down to specifics, although the Strategy for Salmon calls for drawdown of John Day Reservoir to minimum operating pool and an expedited evaluation of a lower drawdown for Lower Granite Reservoir -- and these measures have been expressly endorsed by the Governors of Washington, Oregon, and Idaho -- appropriations for these measures have been incomplete and difficult to obtain. Even where funds are available, implementation by the Corps of Engineers seems to be stretching out over decades.

If we are really serious about salmon recovery, implementation must be fast and complete. The Congress and the Administration will have to work with the region to ensure that the federal dam operators implement the full recovery plan, not simply the parts they agree with. At this point, the fish do not have decades to spare.

A Recovery Plan Must Protect the River Ecosystem.

A fundamental purpose of the ESA is to provide a means of conserving the ecosystems upon which endangered species depend. The Columbia and Snake rivers and their tributaries are a critical part of the ecosystem upon which listed salmon depend, an ecosystem that all parties admit has been badly degraded. The river ecosystem is the part of the salmon life cycle most lethal to the salmon and most in need of improvement, the admitted source of most mortality to migrating fish.

When it comes to improving the river ecosystem, we know the fundamentals that must be at the heart of recovery. First, setting aside the rhetoric over fish flows and looking at the best available scientific information, we know that improving salmon survival requires better, faster flows for migrating fish. This is the conclusion of the state fishery agencies and tribes, and of NMFS in its recent assessment of flow data, an appendix to its 1994-98 Biological Opinion.

The need for improved flows, while not satisfied, underlies the Power Council's Strategy for Salmon as well. By way of illustration, the Power Council recently presented the following scientific hypothesis:

[T]here is a relationship between flow, water velocity, fish travel time and survival such that increasing water velocity increases the survival of salmon and steelhead from the onset of active downstream migration to adult spawner.

Improvement in the level and frequency of favorable mainstem migration conditions for juvenile salmonids will improve fish condition, increase migration rate, reduce exposure to predators, and improve timing and fitness at entry to the sea.

As a result, survival to adult recruitment will improve to levels that, together with full implementation of other measures in this program, will sustain recovery and rebuilding of salmon populations.

With respect to fish barging, the Independent Peer Review Team convened by the U.S. Fish and Wildlife Service recently concluded: "Transportation alone, as presently conceived and implemented, is unlikely to halt or prevent the continued decline and extirpation of listed species of salmon in the Snake River Basin." Similarly, the Recovery Team concedes that the program "has not prevented declines in survival rates or numbers of returning adults," but "may have kept the declines from being worse."

To protect the river ecosystem, the choices are clear -- only flow augmentation, reservoir drawdowns, or some combination of the two will do the job. To restore endangered salmon, the choices are the same. We need to move more fish out of barges and into the river. The best available science shows that transportation alone will not recover our salmon runs.

Conclusion

As recent polls have confirmed, the people of the Pacific Northwest want salmon restored -- for our economy, for our culture, for our obligations to Indian tribes, and for our children and grandchildren.

Our legacy to future generations hangs in the balance. We will either be known as the generation that saved the salmon or as the generation that let them go extinct. Action must be taken now or it will be too late for the endangered salmon of the Columbia Basin. If we act now, and act with urgency, we can still leave our children and grandchildren healthy salmon runs continually leaping upstream.

ATTACHMENT A:
EXCERPTS FROM COMMENTS ON SNAKE RIVER
RECOVERY PLAN RECOMMENDATIONS
(December 1993)

Governor Barbara Roberts, Oregon

- I. [I]t is disappointing to find that the current draft makes choices and recommendations that do not reflect an assessment of the likelihood of success or risk of failure of those choices. p 1.
- II. [B]ased on available data we could not, and should not, justify defaulting today to transportation as a sole strategy. That is particularly so given the fundamental goal of the Endangered Species Act: to protect the habitat upon which threatened and endangered species depend, which for juvenile migrants is the river. p 1.

Governor Mike Lowry, Washington

- III. [B]ecause it was prepared under the authority of the federal Endangered Species Act, the draft recovery recommendations focus only on listed Snake River salmon. As a region, we must continue the comprehensive approach to the restoration of the salmon resources of the Columbia River system outlined in the Council's plan. p 2.
- IV. A regional understanding of the relationships between flow and fish survival is central to effective recovery efforts. While there is disagreement within the region about the precise nature of these relationships, both the Strategy for Salmon and draft recovery recommendations acknowledge that flow augmentation is needed. p 2.
- V. A great strength of the draft recovery recommendations is the recognition of the lack of effective coordination, clear authorities, and timely implementation of fisheries enhancement measures for the Columbia and Snake Rivers. The current systems for fisheries management and implementation of the Council's plans are not working. The transition of recommendations from the Council, through the Bonneville Power Administration to the implementing agencies, needs reform. p 2.
- VI. Many of the recovery strategies identified by the Council and draft recovery recommendations will take years to understand and implement. We must not wait until we have all the answers and everything is in place before moving to

restore and enhance our salmon resources. Fortunately, there are a number of other beneficial strategies -- improved flows, temperature controls, harvest restrictions, and continued habitat improvements -- that can be effectively pursued as the region moves toward its long-term recovery decisions, including those related to juvenile transportation and drawdown. p 4.

Dr. Carl B. Schreck,
Oregon Cooperative Fishery Research Unit

VII. In fact, it is not a recovery plan at all. When one strips away the background material and documentation, all that is left is the recommendation that more committees and research are needed so that the essential plans can be made at some unspecified time in the future. . .The time to bite the bullet is now! We need decisions now, and while they many not be perfect (hopefully they can be corrected as we go along), at least that is better than trying to do it when the runs are down to six fish or less. p 1.

VIII. For each recommendation in the "Draft" there needs to be an explanation or description of "how it will be carried out." p 2.

IX. Unless the plan gets specific, it might as well recommend the development of fairy dust that when applied will, poof! return the runs to historic levels. And then, it might as well also recommend formation of a committee to ensure that the dust is correctly sprinkled. p 2.

X. This gets me to the subject of risk assessment. I was surprised that neither environmental nor genetic risk assessments were applied to evaluate the efficacy of any of the recommended actions. p 6.

XI. [G]iven ESA, there is now the urgent need to look at the whole system. The recovery plan needs to address the entire Snake/Columbia hydrosystem to propose those interim measures needed to prevent extinctions before the true recovery measures are in place. For example, what are the recommended spill and flow patterns needed for the next 5 years and are the estimates made in calculating these erring on the side of fish? p 6.

Ted Strong,
Columbia River Inter-Tribal Fish Commission

XII. The approach in the draft to establishing recovery goals is more political than biological. p 2.

XIII. The section should note that habitat has been widely degraded and that salmon survival in degraded habitat has been significantly reduced. Unless all remaining habitat is fully protected and allowed to recover, the runs will continue to decline. p 2.

XIV. The draft's rejection of John Day drawdown fails to take into account the survival benefits to salmon originating from tributaries such as the Yakima, Wenatchee, Okanogan, Methow, and Umatilla river basins. p 3.

XV. The draft asserts that the biological benefits of a four pool river-level drawdown of the Snake River reservoirs compared to improved collection and transport "are similar," and that only these two options "have the potential to increase survival to the extent needed." The draft's recommendations rest heavily on the results of modeling studies discussed above. Considering the draft's mis-characterization of these studies, the foregoing assertions do not withstand careful scrutiny. With such technical infirmities underlying one of the draft's most serious recommendations, it is clearly inadvisable to proceed "so that the decision now must be based on economic and social factors." p 3.

- If transportation actually causes reductions in survival compared to in-river migration (a TBR less than 1:1), increased collection and transportation may be expected to exacerbate the decline of listed stocks. The draft wholly overlooks this possibility. p 3.

Northwest Power Planning Council

XVI. We believe these immediate actions could minimize the risk of failure and improve salmon survival; however, our analysis also indicates that they will be insufficient -- even when taken together with other significant improvements in other areas of the life cycle -- to reach the rebuilding goals set by the Council. p 7.

XVII. Accordingly, the Council said that as a matter of urgency the region should make all necessary preparations to implement expeditiously a number of

additional measures: drawdown, Snake River storage and improved water use efficiencies. p 7.

XVIII. It is important to keep in mind that, without these measures, it appears highly unlikely that the region can rebuild salmon populations to the levels called for in the Council's Strategy. p 7.

XIX. We note omission of the John Day drawdown. This is one of the measures that we believe should be implemented unless insurmountable problems arise. ... Omitting John Day drawdown from a salmon rehabilitation effort at this time is inappropriate, particularly given the fact that its travel time improvements would require some three million acre-feet of storage if they were pursued using flow augmentation from storage sources. p 8.

Oregon Department of Fish & Wildlife

XX. We believe that this recovery plan needs productivity and utilization goals, an analytical framework for review and decision-making, measurable biological objectives, rebuilding measures with schedules and performance standards, a structure for monitoring and evaluation, and adaptive management flexibility. . . There is no attempt to quantify or rank the substantial degree of risk and uncertainty associated with most actions discussed in the draft. p 1.

XXI. For example, there were no management scenarios which evaluated the combination of draw down in the Snake River and flow augmentation in the Columbia River. p 1.

XXII. Even if transport is marginally effective, it has not halted declines in the listed stocks. From our perspective, based on review of available information, the risks associated with continued transportation are greater than those associated with system changes to improve in-river migration conditions through draw down and flow augmentation. p 4.

XXIII. Rather than rigorously assess the merits of improving in-river migration conditions, the Team enthusiastically endorsed a proposal that is highly speculative and risky. . . Should the recommended option fail it could prove too late to restore the natural migration route in time to recover these stocks, because the two types of options are largely mutually exclusive. p 4.

Washington Departments of Fisheries and Wildlife

XXIV. Spring/summer runs were able to continue productivity with 80 percent harvest rates prior to dam construction beginning in the 1930s, 1960s and 1970s for Snake River stocks. Harvest reductions occurred from the mid 1940s to present low levels in response to declining production most likely associated with hydro construction. p 3.

XXV. Nowhere in the draft recovery plan does the Team discuss the subject of modifying the way the hydrosystem is operated or how Bonneville Power Administration markets power. Both of these actions have a profound effect on seasonal availability of water and could be significantly changed without affecting the system's firm energy load capability. Also, they could be changed without altering the physical structure of dams themselves. p 20.

XXVI. This section needs to be completely rewritten to clearly state the Team's near-term and long-term recommendations for improving downstream passage and their applicability to each of the listed stocks, along with a schedule for implementation of each measure. p 20.

XXVII. The selection by the Recovery Team of an improved collection and transportation program as the preferred means to increase survival of downstream migrants is exceptionally disappointing and appears to be based upon blind faith in future technology rather than logic and scientific reasoning. p 20.

XXVIII. Another fatal flaw of the "decision tree" is that it utilizes survival to Bonneville without regard to the viability of the survivors. This is incredible considering the discussion of the exceptionally poor smolt to adult survival rates associated with the present transportation program . . . Smolt survival is critical but this survival must carry through to adults on the spawning grounds to accomplish recovery. p 22.

XXIX. The deletion of John Day drawdown appears to be based upon the assumption of transportation as the means for downstream passage for Snake River stocks. John Day drawdown could provide benefits for in-river migration, particularly for stock of Columbia River origin! Once again the Recovery Team is proposing actions with no specific regard for negative impacts on non-listed stocks. p 24.

XXX. At page VIII-22 the Recovery Team correctly documents that the present collection and transport program has not prevented the declines in survival rates or adult returns which have lead to the ESA listings. An examination of the current program raises concerns that in near average to above average flows the implementation of transportation may have contributed to the decline. p 24.

XXXI. Another consideration is that wild fish may be more susceptible to crowding and disease in barges, therefore barging may have greater negative effect on wild stocks. p 24.

XXXII. The Recovery Team correctly states that flow augmentation can and should play a significant role in the improvement of downstream passage survival in the near-term. However, they have taken a major step backward by endorsing the storage volume based flow augmentation utilized in 1993. Using flow targets incorporates a base flow to build upon with augmentation. p 26.

XXXIII. The drawdown of reservoirs is certainly not a guaranteed solution at this point in time but it is worthy of serious consideration because it involves working with known quantities -- the existing dams, and there is potential to conduct meaningful evaluations in the near future. Also, it is appropriate to recognize that draw down is not a near-term solution and the implementation of draw down will require substantial modification to the dams involved. This will take several years, but that should not disqualify this concept from serious consideration as a long-term solution. p 26.

XXXIV. Until improved performances can be demonstrated, we view transportation as a means of avoiding severe adverse outmigration conditions during low flow years for some species, but not as a technique with general application for all species under all flow regimes. p 28.

XXXV. These statements are nearly unfathomable! How can the Recovery Team indicate reliance on the existing transportation system for near-term recovery when they have previously acknowledged that "the collection and transport program for smolts has not prevented declines in survival rates or numbers of returning adults." Are they trying to tell us that recovery will be

accomplished via continued declines in smolt to adult survival? p 28.

Columbia Basin Fish and Wildlife Authority,
State and Tribal Analytical Team

XXXVI. The Team's analyses did not specifically investigate any flow augmentation strategies nor did they explicitly address this question from an indirect approach through a systematic comparison of different flow levels. p 1.

XXXVII. Conclusions drawn from the Team's interpretation of modeling results in Chapter VIII appear to be driven by their judgement that transportation is highly effective. This is reflected in their selective presentation of modeling results, and manipulation and reinterpretation of these results. p 2.

XXXVIII. The Team recommended improved collection and transportation as the preferred recovery option. . . . without any specific explanations of how to attain sufficient improvements to recover wild salmon. Several of the Team's generalized recommendations. . . . point to the serious problems with the current transportation program, including crowding, stress, disease and biological unknowns . . . p 2.

XXXIX. Despite transporting up to 80% of the spring/summer chinook smolts passing Lower Granite Dam . . . the stocks have continued to decline under average and poor flow conditions. These declines do not support the statement that "transportation of smolts around the dams has significantly increased the number of adults returning to the Snake River." p 2.

XL. The Team's review of transportation studies should have recognized that there were serious problems with the studies cited (page 22-23) regarding inferences to wild salmon returns . . . p 2.

XLI. A more comprehensive review of transportation also would have indicated that transport to "control" ratios often decline upstream of Bonneville Dam. The pattern is apparent for both Snake River and mid-Columbia River stocks, suggesting a homing problem. p 3.

XLII. The effects of flow augmentation on the survival of listed Snake River chinook stocks was not addressed in the Team's Plan. p 3.

XLIII. Unlike the Team's critiques of flow and draw down, there is a noticeable absence of any discussion of the limitations of transportation studies cited, or the uncertainty of the inferences made by the Team. p 5.

XLIV. The Team has also apparently not considered that if this highly speculative project [a fish-collecting facility at the head of Lower Granite Reservoir] would turn out to be successful, it would mean a drastic change to the lower Snake River (and possibly lower Columbia River) ecosystem. The near total removal of juvenile Snake River salmon from these reaches, accompanied by the complete shift to management of the lower Snake and Columbia River flows for hydropower, could have unforeseen negative impacts on remaining populations of other animals, some of them depressed or rare (e.g., sturgeon, lamprey, etc.). p 5.

XLV. [T]he recovery measures were evaluated within the narrow confines of economic and social constraints and not on the basis of biological requirements for recovery and physical constraints of the hydrosystem. p 13.

XLVI. The Recovery Team did not evaluate alternative management actions with the goal of increasing instream survival of migrating juvenile salmon. For example, there were no management scenarios which evaluated the combination of draw down in the Snake River and flow augmentation in the Columbia River. p 13.

Idaho Department of Fish and Game

XLVII. [W]hile the argument is made against returning to pre-development conditions, there is no inquiry by the Draft into the idea of relative improvement of migration habitat from present day conditions. p 5.

XLVIII. It appeared the Team was unaware of ongoing activities in the region concerning the drawdown strategy, and has not been active in examining the potential of drawdown and drawdown options to address several issues of mainstem survival and the time for implementation. p 41.

XLIX. Despite the number of times the issue is mentioned or discussed, the Team fails to state what they believe "adequate in-river migration" conditions are. This oversight should be addressed. p 50.

L. According to the Team, they have "concentrated on a thorough evaluation of the various elements that might contribute to recovery of the listed Snake River species." To evaluate implies a ranking or measuring, a judgement. We find few evaluations in this document because the Team did not predict biological gains from actions, or even identify the aggregated or single actions most likely to provide measurable benefits. p 63.

LI. The draft is contradictory and internally inconsistent for: Failing to propose recovery actions based on scientific information; Failing to propose recovery actions which have some evidence to meet stated recovery goals, environmental criteria and delisting criteria; Failing to propose actions that reverse or ameliorate factors identified as causing decline of the species; Applying different criteria for improvement of spawning and rearing habitat than for migration habitat; and for applying different time horizons for implementation of recovery actions. p 65.

LII. . . . Petrosky (1992) found that total collection and transportation effort (measured by numbers transported) failed to positively relate to numbers of adult returns. We believe this quantitative information is instructive and should provide a reality check concerning the poor viability of collection and transportation as a conservation and recovery tool. p 66.

LIII. Instead of recommendations, the Team has provided a cornucopia of various elements that might contribute to recovery of listed salmon. The document is full of choices to be made, but there is no guidance, advice, or priority to ensure that choices are effective and will contribute to measurable recovery. p 71.

LIV. [T]he document and the opinions expressed are extremely speculative and almost totally lacking in documentation or substantiating evidence. p 71.

Federation of Fly Fishers

LV. Salmon cannot recover and probably will not even survive if the dam facilities and their manner of operations are not changed significantly and *QUICKLY*. Time is of the essence. The proposed Recovery Plan envisions a go slow, cautious approach. This is a recipe for extinction. Survival and long term health of Snake River anadromous salmonids is predicated upon in-river migration by adults and juveniles alike. The Recovery Plan does not reflect this reality.

LVI. While there is certainly room for improvements in tributary and mainstem habitat, the Plan rejects the obvious--the major obstacle to recovery of Snake River Salmon are the in-river obstructions to adult and juvenile migration. All upstream habitat could be returned to pristine condition and Snake River salmon would still be doomed unless the Snake dams are either removed or modified significantly. Spending money on upstream habitat without first fixing passage problems creates the illusions that "something is being done" to save salmon when in reality salmon will continue their slide to extinction. These proposals are similar to treating a cold while a patient bleeds to death. Stop the bleeding.

Fish Passage Center

LVII. The most serious limitation of the Plan is that it does not include any analysis which indicates that the listed stocks will rebuild and recover with implementation of the Plan. p 1.

LVIII. The Draft Plan wagers recovery of listed stocks on a concept of protection which is primarily removing the listed stocks from their habitat. This concept of collecting juveniles in upstream surface collectors, collecting adults at downstream sites, and transporting migrant in both directions is the original concept of mitigation attempted when the system of large storage reservoirs was first developed. The Team has come full circle and has arrived at the unsuccessful mitigation and protection concepts of the early 1960's. p 1.

LIX. The data presented by the Team shows that the increase in transportation and the decline of listed stocks occurred concurrently. Transportation is a major perturbation of juvenile migration. Unlike the Team's treatment of hatchery mitigation programs, they neglected to consider the likely possibility that the transportation of smolts mitigation program may have contributed to the decline of listed stocks.
p 2.

LX. Although the Team discusses the effect of the operation and development of the hydrosystem on anadromous fish, the Team does not consider any modification of the present operations to facilitate the needs of anadromous fish. The Plan simply assumes the status quo operation of the hydrosystem and does not consider or discuss the need or potential to change load shape through power marketing, conservation and exchanges.
p 2.

The Sierra Club

LXI. The draft recovery plan offers no assessment whatsoever of the relative impacts among the various factors causing the decline of Snake River salmon. The Team cites hydropower development, habitat destruction, hatcheries, harvest, disease and natural factors, but provides no guidance on which kills most salmon. The National Marine Fisheries Service, Northwest Power Planning Council, and even the Bonneville Power Administration have estimated that at least 80 percent of the human-inflicted mortalities to these fish come at the eight mainstem dams of the Lower Snake and Columbia Rivers. p 2.

LXII. Lacking any analysis of the relative magnitude or significance of fish mortalities, the Team presents a long cafeteria line of recovery measures, but cannot predict the effectiveness of those recovery actions. p 2.

LXIII. Thus the central necessary feature of any viable plan -- a critical path to the species' recovery -- does not appear in the Team's draft recommendations. p 2.

LXIV. And consequently the Team sets priorities for recovery actions on the basis of timeliness and/or cost rather than measurable benefit to the salmon -- an exercise in futility because, without a rigorous foundation in biology, any and all cost analyses of, or timeliness for, salmon recovery become so much smoke in mirrors.

LXV. Similarly the Team fixates on the costs of its recommended recovery plan and the proposed actions, but gives no consideration whatsoever to the economic benefits of salmon recovery. p 2.

LXVI. [T]he Team ignored biological evidence and computer modeling from agency and Tribal biologists that showed that nearly two decades of juvenile fish transportation out of the Snake River Basin have actually contributed to the decline of wild salmon stocks. First, barging and trucking smolts has its own lethal impacts. Second, continued operation of the transportation program has postponed any real effort to improve in-river migration conditions. p 3.

American Rivers

LXVII. Unfortunately, specific measures, standards, and timetables are lacking throughout the Team's Recommendations. While they do contain informative discussions of the nature of salmon decline, the Recommendations do not lay out a step-by-step approach to respond to that decline. p 1

We still do not have a critical path leading to recovery at a definite point in time. We still do not have an analysis indicating that recovery of Snake River salmon, which has proven so elusive in the past, will occur under the Team's Recommendations. p 2.

LXVIII. The Team should revise its Recommendations consistent with the Power Council's Strategy for Salmon. It should use the Strategy as a starting point, filling in a critical path for implementation, including rebuilding schedules, survival standards, and performance standards. It should embrace the goal of harvestable upriver runs to provide renewable, economic benefits to the region for generations to come. p 2.

LXIX. It goes without saying that the Columbia and Snake are no longer natural rivers in the pure sense, but that does not mean that a more natural river is not economically possible or biologically desirable. The Team simply failed to fully investigate the full range of short term and long term options for improvement of the river ecosystem. It did not look at the full range of flow augmentation alternatives. It did not look at modifications to power planning, operations and marketing. p 3.

STATEMENT OF THANE TIENSON ON BEHALF
OF
SALMON FOR ALL,
TO THE ENVIRONMENT SUBCOMMITTEE
OF THE
HOUSE MERCHANT MARINE AND FISHERIES COMMITTEE

Hearing on the Snake River Salmon Recovery Team Final Recommendations
Washington, DC
June 30, 1994

My name is Thane Tienson, and I am testifying on behalf of Salmon for All, a nonprofit organization representing the lower Columbia River gillnet fishing industry, including both fishing families and fish processors, located at the mouth of the Columbia in the community of Astoria, OR, where I was born and raised. Our associate members include an additional 130 marine suppliers, stores, retailers and other small businesses in our community which are economically dependent upon salmon as a resource. The gillnet fishing industry is also an industry whose economic needs must be considered every bit as relevant to this discussion as those of the Columbia River Alliance and its members, *if not more so*

In fact, we are the industry *most seriously and most directly affected* by the destruction of salmon in the Columbia River. Furthermore, the salmon fishing industry as a whole (of which the gillnetters we represent are a part) has long been a major economic factor in the entire regional economy of the Pacific Northwest. It is not only the Columbia River gillnetters who have been affected -- the loss of Columbia River stocks has triggered major closures up and down the entire Pacific coast (including Alaska) for the *entire multi-billion dollar salmon fishing industry*. Salmon closures caused by Columbia river declines are also on the verge of triggering an international "fish war" with Canada. The current dispute over the Pacific Salmon Treaty is also *directly* related to the decline of Columbia River stocks because endangered north migrating Columbia River stocks are being harvested by Canadian fishermen who are not restricted (as we are) by the Magnuson Act or the ESA.

Likewise, the recent coastwide closure of the entire salmon season in the lower 48 states is also in no small part driven by the disastrous situation in the Columbia and the need to protect these weakest stocks when they mingle with otherwise abundant stocks.

The Columbia was once the most productive salmon river in the world. Restoration of the Columbia Basin salmon stocks is a major key to the recovery of the whole salmon fishing industry. Major fishing closures which have already occurred cannot be reversed (and further closures in Alaska cannot be avoided), *unless and until the salmon stocks in the Columbia River system have been fully recovered.*

Yes, there will be a cost required to fix the problems in the Columbia. However, the **cost of doing nothing** would be much higher — that price would be the ultimate destruction of the largest remaining chinook salmon fishery in the world, and the only one under US control. The economic impact of such a disaster on the US economy would include the loss of nearly 100,000 jobs and billions of dollars in annual income. Salmon mean jobs and dollars. Without the salmon, those jobs and dollars are gone forever.

The annual cost of doing nothing to fix the Columbia River hydropower system is already extremely high. According to estimates by the Northwest Power Planning Council, the hydropower system as currently constructed and operated accounts for the destruction of between 5 million and 11 million salmon adult equivalents every year.¹ Since adult salmon can generate up to \$100/each in personal income impacts as they travel through the stream of commerce, this means that the "externalized costs" of the hydropower system to the fishing industry as currently managed are **between \$500 million and \$1.1 billion dollars annually.** This is the "cost of doing nothing" — a price that coastal and many inland communities must pay year after year for the foreseeable future until major changes in the system are made. However, if even a fraction of this economic value can be recaptured by recovery of these stocks up to harvestable levels, the total "economic dividend" returned to the region would be *more than enough to justify the one-time costs of major system reconstruction.* Furthermore, this economic dividend would continue to come into the region year after year — while the costs of retrofitting the hydropower system must be paid out only once. Hydropower reform is therefore not a "cost" so much as it is a capital investment in the economic future of our industry which will generate more regional jobs and income and increase the economic stability of our coastal communities. The Columbia River gillnetters have long been advocates of

¹ Northwest Power Planning Council Publication *Strategy for Salmon*, Vol. 2, pg. 17.

conservation and protection of these stocks. In fact, no single industry has done more or given up more for the sake of conservation than we have. There is in fact no directed harvest anywhere in the Columbia on any ESA listed stocks, *nor has there been in many years*. Yet today there are fewer fish in the river than when all directed harvests on these listed stocks were stopped. Therefore harvest is not the cause of these declines, nor is regulation of harvest going to lead to a solution. The crash of these stocks is caused by the *dams themselves and how they are operated*, and it is the dams themselves (and their mismanagement) that must be fixed. This fact must sooner or later be faced: **on average, 90% or more of all human-induced mortality in the Columbia and Snake River systems is caused by the hydropower dams, as compared to less than 5% attributable to all commercial, sport and tribal fishing combined.**² Congress will get far more "bang for its bucks" by once and for all fixing the hydropower system than by any other option.

The fishing industry has done its part and then some. It is now time for other industries to pony up their share of this effort, including those industries (such as the aluminum industry), which receive massive federal subsidies in cheap power from the system. Today the Northwest's power is often considered the cheapest in the nation. However, once you figure in the "externalized" environmental damage and increased social costs of this damage, you will soon arrive at the *true* costs created by an artificially distorted rate structure. The true costs of that "cheap power" has been tens of thousands of fishing jobs and billions of dollars of personal income impacts lost every year, not to mention the tens of millions of dollars more each year now required for increased social services to help remedy the human suffering this destruction has caused.³ Once these real costs have been figured in, it may well be that the Northwest has the most expensive power in the nation,

2. Estimate of human-induced mortality from Oregon Dept. of Fish & Wildlife.

3. Coastal communities in our area report poverty levels have risen in just the past two years from 40% to 90%. Bank foreclosures on boats and homes have risen dramatically. Equipment capital investments in boats now have little or no market value. A gillnet permit that would have been worth \$50,000 as recently as 1988 now has little or no economic value. The economic cost in terms of increased social services required to deal with increased family stress, drinking, domestic violence and other similar problems linked to unemployment has put increasing burdens on local communities while tax revenues needed to pay for these services are at an all-time low.

because it has been built on the blood and suffering of our coastal communities.⁴

The Bevan Report is in our view merely a way to justify continuing to do nothing of any consequence to change the system itself. It relies heavily on artificial transportation programs which have recently been shown to have little scientific justification, and in fact may be doing more harm than good. The Bevan Report largely dismisses the body of evidence that supports flow augmentation as a means for increasing survival rates by flushing the fish away from the turbines, thus avoiding turbine mortality. Turbines have a far greater negative impact (10-20% mortality) than observed mortalities (0-3%) resulting from spill programs.⁵ What is far worse, the Bevan Report blames the beleaguered fishermen for losses of salmon when the real blame belongs with the hydropower system itself. While there is some good in it, the majority of the recommendations are, in fact, a step backwards -- no more than minor tweaks of the system of the type which have already been discredited in US District Court as inadequate, insufficient and ineffective and which are, in turn, based heavily on a discredited 1993 NMFS Biological Opinion which has already been thrown out of Court as "arbitrary and capricious."⁶

4. According to information cited in a recent Congressional report "BPA at a Crossroads" (May, 1994), by the special BPA Task Force (Congressman Peter DeFazio, Chair) to the House Committee on Natural Resources, the aluminum industry is subsidized by BPA to the tune of about \$15 million/month (\$172 million/yr), and the water irrigators in the Columbia are subsidized by BPA to about another \$59 million/yr. For comparison, the entire federal relief program for the Pacific coast salmon industry recently declared by the Dept. of Commerce is \$15.7 million -- about what the federal government gives away to these other two industries in federal subsidies *each month*.

5. Turbine mortality is known to be between 10-20% for each dam, multiplied by 8 dams (see Northwest Power Planning Council (1986), "Compilation of information on salmon and steelhead losses in the Columbia River Basin." 252 pages and appendices; Detailed Fish Operating Plan (DFOP) with 1994 Operating Criteria (1993), 44 pages and appendices, by Columbia Basin Indian Tribes and the State and Federal Fish & Wildlife Agencies). Turbine mortality is the leading cause of salmon destruction in the hydropower system, and increased spills and other flow augmentation programs are effective because they guide outmigrating smolts away from the turbines. Any study of comparative risks from such spill programs has to be a comparison between the 0-3% mortality due to nitrogen supersaturation (so called "gas bubble disease") versus the known 10-20% mortality which would otherwise result in the turbines. Any reasonable comparison of the two puts spills head and shoulders above other options for increasing outmigrant survival rates.

6. *Idaho Dept. of Fish & Game vs. NMFS, et. al.*, US District Court (Oregon) No. 92-973-MA (lead case) -- Opinion of Judge Marsh 3/28/94 as discussed elsewhere in the text of this statement.

Fishing Impacts Play a Very Minor Role Compared to Hydropower Turbine Losses

Snake river spring chinook are an ESA listed fish. There has been *no directed commercial fishery on snake river spring chinook since 1977*. What few of these listed fish are caught in gillnets are those few which are strays accidentally caught when fishing on the healthy runs of spring chinook which come from the Willamette River (and to a lesser degree from the Sandy, Cowlitz, Kalama and Lewis rivers) -- almost all of which are hatchery in origin. Very few threatened or endangered fish are taken in the small gillnet season still remaining in the Columbia, and every effort has been made by the industry to avoid catching them even by accident. Any activities which may result in an "incidental take" of any of these protected fish are subjected to full scrutiny by several agencies and cannot proceed if they are deemed to pose a significant risk to the continued existance of the species.

Gillnets are used instead of other gear in the Columbia River, just as they are in the Fraser River and Bristol Bay, Alaska and other healthy fisheries throughout the world because they are the most easy controlled and directed, and are the best gear to very precisely target the fish desired -- and therefore most completely avoid the fish that should not be caught. This selective avoidance strategy is highly successful. In fact, far more ESA listed fish are "harvested" by the dams than by fishermen. To give some real-life examples of the disproportionate impact of the dams versus harvesters, refer to the following table:

Comparision of commercial gillnet mortality vs. dam mortality for Snake River wild spring chinook for most recent years

Year	Total run size at Columbia mouth	(1) # taken by commercial gillnets in river	(2) # killed in dams	% of total (1+2) killed taken by dams
1992	12,261	21	2,989	96.39%
1993	8,828	24	1,705	98.61%
1994	1,688 (est.)	83 (est.)	437 (est.)	84.04%

Chart compiled from official figures from Oregon Dept. of Fish and Wildlife and Washington Dept. of Fisheries

It is clear from these figures that the principal problem for these fish is not gillnet harvesting, it is the dams themselves. Also keep in mind that even though there has been absolutely no directed fishery on Snake River spring chinook in 17 years, there are now *fewer of these fish than when all*

commercial fishing on them stopped in 1977. This fact alone should tell you that the real cause of these declines is elsewhere — the hydropower dams themselves, as well as quite possibly the barging and other surface transportation programs now suspected of actually contributing to (rather than reversing) these declines. In any event, after all these years with no season but with continued declines, it should at least be clear that there is no causal link between commercial fishing and these declines. Little if anything can therefore be gained by additional restrictions on fishermen. Since there is no season, there is no season to close down.

The Columbia River gillnet season is probably the most studied and most regulated fishery in the entire country. The commercial spring chinook season must now be approved not only by NMFS, but also by the Fish and Wildlife agencies of both Oregon and Washington, and by Tribal fisheries managers as well. It is strictly enforced by law enforcement authorities on both sides of the river as well as Tribal law enforcement officers. All commercial catch must be registered with the states before the fish can go to consumers. Regardless of catch, no commercial fishing is allowed after March 10th of each year specifically in order to protect the Snake River wild chinook which start to migrate into the river in significant numbers only after that date.

Focussing on harvesters is really just blaming the victim for the crime. The crime itself is being committed every day by the hydropower turbines, which grinds up millions of fish every year to the detriment of fishing communities throughout the region. Comparing turbine mortality rates of 10-20% per dam with fishing mortality rates of 5% makes it clear — **twice to four times as many fish are killed at each dam as in all sport, commercial and tribal fishing combined for the whole river.** There are also eight dams which these fish must survive.

There is clearly a hidden agenda underlying the reason the Columbia River Alliance (CRA) and its industrial members support the total elimination of the last remaining portions of the Columbia River gillnet industry. CRA is a front organization for the aluminum industry and other major power users who are also heavily subsidized by BPA at taxpayer expense. CRA is by no stretch of the imagination a "conservation organization" as they would have you believe, and it certainly has no interest in restoring salmon to harvestable levels because that would mean changing the status quo and reforming the hydropower system to protect salmon — reforms which would require economic contributions to salmon recovery from other industries (such as the aluminum industry) for the first

time and may also cut into their extremely lucrative federal subsidies. By advocating the elimination of the gillnetters (through such programs as mandatory buyouts and other measures favored by the Bevan Committee), they hope to eliminate their chief political opposition and well as the chief proponents for making real changes in the system itself.

Recovery costs can only be recaptured by maintaining an economically viable fishing industry to help defray the costs

Salmon mean jobs. Salmon mean income not only for coastal communities dependent upon commercial fishing, but also for many inland communities heavily dependent upon recreational fishing to attract tourist dollars. Salmon also mean tax revenues for local communities to help support schools and public services. In the midst of biological considerations, let's not forget what recovery should be for -- *the restoration of the fishing industry*. Any recovery that results only in "museum piece" streams but which does not result in a harvestable surplus of fish or a restored fishing industry must be deemed a failure which would only perpetuate and make permanent the current net economic loss to society as a whole.

The Bevan Team admittedly never deals with economic or social issues. They felt that such considerations were outside their charge. However, these issues must be dealt with nevertheless as a matter of public policy.

Supposedly, the Bevan Team devoted themselves to technical and scientific issues, including the best fishing gear to use for salmon in the Columbia river. Yet, no fisherman was even consulted by the Recovery Team. The report evidences this failing most clearly when calling for the employment of selective gear for live capture -- implicitly suggesting a return to the use of traps and fishwheels used on the river in the early part of the century, before the dams forever changed the river's hydrology. These traps also relied heavily on large hooks to kill seals and sea lions that constantly raided traps. Traps were built on pilings, many in the middle of the river, and owned by large corporate interests. Suffice it to say, the river has changed, society has changed, and the law has changed. Indeed, traps and fishwheels are now illegal in both Oregon and Washington.

The primary reason that gillnets are still used today in the Columbia River by both Indian and non-Indian fishermen is that they are the *most selective means* of fishing for salmon. Gillnets always

produced more than all the other methods of capture combined, and are still the most widely used fishing gear found on the West Coast. Their effectiveness, low cost, high-volume of catch per unit effort, selectivity, and flexibility remain unsurpassed by any other form of gear. All evidence indicates that the gillnet is the most flexible tool we have developed to date for in-river harvest, and there is absolutely no evidence that it can be replaced with anything better.

Moreover, the elimination of the gillnet fishery, as proposed by the Bevan Team, removes the incentive to address the curious environmental problems created by dam and irrigation agriculture. The existing fishery's management regime, on the other hand, is one of weak stock management in mixed-stock fisheries. This existing system provides an enormous incentive to protect habitat to enhance weak stocks so that they will support more selective harvest.

In addition, selective harvest, as proposed by the Bevan Team, fails to deal with the issues of handling stress, marketability and disposition of the remainder of the catch, cost of method of capture, ownership of method of capture, return on investment, all the fishers displaced from other fisheries, riparian ownership, and environmental factors involved in selective harvesting. In sum, the Bevan Report's most glaring weakness is that portion of the plan dealing with harvest.

There is no doubt that a substantial investment will be required to take the steps necessary to reform the hydropower system and restore the river system ecologically. However, we must not forget that every increase in salmon production from the Columbia River system will translate into more fish available for commercial harvest. This means more food on America's tables, more jobs and more income for the Northwest. **This economic dividend will help to defray the costs incurred in the recovery effort.** This would be the case, however, *only* if in the recovery process we encourage and maintain a viable fishing industry. The Bevan Committee recommendations for almost the total elimination of the Columbia River fishery thus make no economic sense whatsoever. If there is no longer to be a fishery, how will the economic costs of hydropower system reform ever be recovered by society at large?

The Bevan Report relies on barging and other artificial salmon transportation systems which have no demonstrated effectiveness — and may themselves be a leading cause of declines

Barging and trucking salmon around the dams began in 1968 as a short-term experiment, and has increased in scope almost every year since then. However, these artificial transportation methods have never been subjected to NEPA analysis (the program began before NEPA was passed into law and was "grandfathered" in) nor have they been systematically studied.

In 1993 a suit was brought in US District Court in Oregon against NMFS, the Army Corps of Engineers and others to require full NEPA analysis of artificial transportation. This suit was successful, and the US District Court (Judge Marsh) order a full NEPA analysis to be done.⁷ In response to that court order, NMFS recently commissioned an independent scientific peer review of the scientific rationale for barging and other artificial salmon transportation programs. This study (the "Mundy Report," after the Chairman of the review team, Dr. Phillip Mundy, Ph.D.), was coincidentally also released in May, 1994, at about the same time as the final Bevan Committee Report. The Mundy Report is not cited in the literature referenced in the Bevan Report, and apparently its findings were not included in the data analyzed by the Bevan Team.

After looking at all the data supporting artificial transportation, the Mundy independent review team concluded:

"As presently conceived and implemented, transportation is unlikely to halt or prevent continued decline and extirpation of listed species of salmon in the Snake River Basin."

While acknowledging that there was some evidence that transportation may have some positive impacts in very low flow years or for some species (such as steelhead, which is not ESA listed), the Review Team could find little evidence to support the presumption that transportation was justified under most circumstances, and also found evidence that in some cases transportation may have a

⁷. *Northwest Environmental Defense Center, et. al. vs. NMFS, et. al.* (USDC - OR, No. 93-870-MA). Judge Marsh stated in his final opinion that case as follows: "It is at this point that I ultimately find that the COE [Corps of Engineers] failed in its NEPA obligations in 1993. From the record before me, I find that the COE has spent almost all of its research and reform efforts on improvements in the transportation program itself — improvements in structure such as collection and bypass facilities and improvements in flow to aid collection.... I find that the COE's failure to 'significantly analyze' transport impacts and alternatives within the 1993 SEIS for flow improvement measures is arbitrary, capricious and not in accordance with the law.... Based on the foregoing, I find that the COE acted arbitrarily and capriciously with respect to its 1993 NEPA analysis of flow measure improvements." (Opinion of 12/22/93)

negative impact instead of a positive one:

"However, under passage conditions associated with higher river flows than those of 1973 and 1977, the responses of relative survivals of spring summer chinook to transportation may be equivocal, and possibly negative, with overall higher survivals for both transported and untransported salmon."

"[Without better information] the utility of transportation for recovery of ESA listed can not be objectively judged. While juvenile salmon transportation may not be discounted as a recovery measure, the factual basis is now insufficient to determine the relative efficacy of transportation as a mitigative measure for recovery of salmon populations listed as threatened and endangered in the Snake River Basin. When the transportation option is exercised, it must be recognized as an experimental measure...."

*"Stock-specific assessments of survivals of transported salmon relative to survival of untransported salmon are not possible from the studies so far conducted."*⁸

Put bluntly, barging and other artificial transportation methods have for many years been little more than a smokescreen for doing nothing of any real substance to change a fatally flawed hydropower system. Programs like this should be seen in their true light – as little more than shots in the dark with very little scientific justification. In fact the Mundy Report itself states:

*"Available evidence is not sufficient to identify transportation as either a primary or supporting method of choice for salmon recovery in the Snake River Basin."*⁹

In light of the Mundy Report, it is appalling that the Bevan Committee relied so heavily on barging and other transportation boondoggles as the primary recovery strategy.

The only fish that have ever been shown to benefit from barging are steelhead, not salmon. Any fisherman can tell you that chinook salmon, in particular, are far more delicate than steelhead. The Bevan Report terms the Columbia River a "migration corridor." The term is indicative of the mentality of Dr. Bevan and his cohorts who drafted the report, and who called for the creation of a Salmon Oversight Committee staffed by themselves and other "prestigious" academics. In fact, the care and detail Dr. Bevan and company devoted to deliberations of the makeup of this new layer of

⁸ P. R. Mundy, et. al., *Transportation of Juvenile Salmonids from Hydroelectric Projects in the Columbia River Basin: An Independent Peer Review* (May, 1994). Quotes from Conclusions, pp. 116 & 118.

⁹ Mundy Report, *ibid.*, Executive Summary (pg. viii).

government, their "executive" compensation and sabbaticals, stands in stark contrast to their self-styled quest for the "cheapest and best way" to further reduce fishing, and their complete insensitivity to the plight of fishermen, fishing-dependent families, and the coastal and river communities whose lives and futures they so cavalierly ignore.

The Columbia River is not a "migration corridor ". It is a river, a complex ecosystem, and if salmon stand any chance of being recovered, it can only occur if we treat them as living creatures dependent upon a river with decent spawning and rearing habitat, and the ability to swim to sea and return to spawn without experiencing 90+% mortality from the hydrosystem.

**Flow augmentation programs are effective and have substantial scientific support
but are largely discounted by the Bevan Committee**

The Bevan Report does recommend drawdowns of the Lower Snake River Reservoirs to either near spillway crest or to river level, and we support these recommendations. In emphasizing transportation, however, the Bevan Team de-emphasizes flow augmentation needs throughout the rest of the system.

The principal concern with spilling water over the dams is the potential for supersaturation of water with nitrogen. At sustained high levels, nitrogen supersaturated water can cause nitrogen gas bubbles in the circulatory systems of fish and ultimately impair survival -- essentially giving them the fish equivalent of what we call "the bends" in humans, and what is technically referred to as "gas bubble trauma (GBT)". However, nitrogen supersaturation is usually not fatal to fish. In fact, a certain amount of nitrogen supersaturation occurs naturally, and fish have evolved mechanisms to avoid it or to reduce its impact on their systems. The effect is also diminished as fish swim deeper, since at greater depths the increased water pressure helps contain the excess nitrogen and allows the fish to dissipate it naturally. Most fish automatically dive deeper (or "sound") when they take on excess gas as a natural mechanism to avoid gas bubble trauma.

Studies have demonstrated a clear correlation between higher survival rates from smolt to adult and increased flow within the river. When faster flows occur, outmigrating smolts avoid predators better and reach the sea much sooner. Furthermore, properly timed intentional spills over the dams help outmigrants by flushing them around the turbines (thus avoiding 10-20% turbine mortality rate)

and moving them downstream to safety ¹⁰ The real issue in judging the effectiveness of such spill programs is to ask the question whether the chances for survival are better in the turbines or with a slight chance of GBT. In most cases, turbine mortality would be much greater.

Recently NMFS designed and implemented (with other agencies) an emergency spill program to help increase outmigrant smolt survival. That program was able to keep nitrogen supersaturation levels to 120% or below — not only well below the range of serious side effects, and also *well below the average of supersaturation levels resulting from incidental spills just the year before by random chance*. Spills of water over the dams occur all the time -- whenever there is less power being drawn by consumers than produced by the turbines (as for instance during summer months), or when rains bring higher levels of inflow than can be stored. In fact, *levels of spill which occurred in 1994 during this program were of considerably less volume than those that occurred in 1993 because of naturally high runoff levels*. No signs of impacts from GBT are generally observed until levels of supersaturation reached levels far in excess of the 120% cap for the 1994 emergency spill program. Even at these maximum allowed levels any observable effects were minor. Extensive studies at mainstem dams throughout the basin document that juvenile mortality from spills ranges from 0-3% — far less impact than the 10-20% immediate mortality observed from letting the fish go through the turbines instead.¹¹ Spilling programs are neither new nor radical — spilling water over the dams is done every year. Why not do it at a better time and use these spills to benefit the fish?

¹⁰ Sims, C. W., and F.J. Ossander (1981). *Migrations of juvenile chinook salmon and steelhead trout in the Snake River from 1973 to 1979: a research summary*. Report dated June 1981. Coastal Zone and Estuarine Studies Division, Northwest and Alaska Fisheries Center, NMFS, Seattle, WA [SS/III.A.2].

¹¹ See Northwest Power Planning Council (1986), *ibid.* [see note 5]. Raymond, H.L. (1988). "Effects of hydroelectric development and fisheries enhancement on spring and summer chinook salmon and steelhead in the Columbia River Basin." *North American Journal of Fisheries Management*, Vol. 8 (1-24). Holmes, H.B. (1952). "Loss of salmon fingerlings in passing Bonneville Dam as determined by marking experiments." Unpublished manuscript. US Fish & Wildlife Service. 62 pages. Ledgerwood, R.D., et. al. (1990). "Relative survival of subyearling chinook which have passed Bonneville Dam via the spillway or the Second Powerhouse turbines or bypass system in 1989, with comparisons to 1987 and 1988." Unpublished manuscript; Iwamoto, Robert N., et. al. (1993). "Survival estimates for the passage of juvenile chinook salmon through Snake River dams and reservoirs, 1993." *Annual report to Bonneville Power Administration*. Coastal Zone & Estuarine Studies Division, Northwest Marine Science Center, NMFS, Seattle, WA. Draft report. 140 pages.

The Bevan Committee recommendations do no go far enough toward changing the system

In general, these recommendations are aiming at the wrong targets. Minor fixes of the system and more barging will not solve the problem. The Bevan Team suffered from the same unwillingness to look at the full range of options that caused Judge Marsh to throw out the 1993 Biological Opinion (in which NMFS overruled its own scientific staff recommendations to adopt a "no jeopardy" ruling for the hydropower system as a whole). In Judge Marsh's opinion, after lengthy analysis of the NMFS 1993 Biological Opinion, he noted:

*"NMFS has clearly made an effort to create a rational, reasoned process for determining how the action agencies are doing in their efforts to save the listed salmon species. But the process is seriously, significantly, flawed because it is too heavily geared towards a status quo that has allowed all forms of river activity to proceed in a deficit situation — that is, relatively small steps, minor improvements and adjustments — when the situation literally cries out for a major overhaul. Instead of looking for what can be done to protect the species from jeopardy, NMFS and the action agencies have narrowly focussed their attention on what the establishment is capable of handling with minimal disruption.... [I] find that defendants' 1993 Biological Opinion on Hydropower Operations is arbitrary and capricious and otherwise not in accordance with the meaning and underlying purposes of the Endangered Species Act, Sec. 7(a)(2), with respect to the chosen jeopardy standard and their consideration of reasonable and prudent alternatives to avoid jeopardy."*¹²

The same problem is carried over here -- these recommendations simply do not go far enough and amount to only fairly minor changes of a system that "cries out for a major overhaul." Its time to admit that the system itself has created this biological disaster and get on with the costs of the changes that must sooner or later be made.

Conclusion and summary

To summarize, the chief problems with the Bevan Committee's recommendations are as follows:

- (1) Overemphasis on artificial transportation programs which have little demonstrated scientific validity or efficacy;
- (2) Too little emphasis on spill and other flow augmentation programs which we know are effective and which are already a well worked out tool for better fish management;

12. *Idaho Dept. of Fish & Game vs. NMFS, et. al.* (USDC-OR No. 92-973-MA), Opinion of Judge Marsh, March 28, 1994.

(3) Overemphasis on further fisheries restrictions when it is not the fisheries that are the problem,
(4) Overall, these proposals are simply very minor "tweakings" of a hydropower system that can and should be more fundamentally modified,

(5) Finally, the whole stated goal of the program is merely to maintain "self sustaining populations" and no more. The recovery goal should be to reestablish and restore a viable fishery by providing harvestable surpluses. While this may be a higher standard than simply "freezing in" the current severely degraded status quo, ultimately only by restoring a viable and economically productive fishery will any of the costs of these efforts ever be recovered



O R E G O N T R O U T

TESTIMONY ON THE
 RECOMMENDATIONS OF THE SNAKE RIVER SALMON
 RECOVERY TEAM
 BEFORE THE HOUSE COMMITTEE
 ON MERCHANT MARINE AND FISHERIES

June 30, 1994

By Bill M. Bakke
 Director of Resource Conservation

I. INTRODUCTION:

Oregon Trout is the lead petitioner for the three races of chinook in the Snake River listed under the Endangered Species Act (ESA). Our intent, in taking this action, is to recover these salmon before they become extinct. These native salmon populations represent what is left of the largest chinook runs on the West Coast of North America. These salmon are an ecological treasure that, once lost, cannot be replaced. However, they could once again contribute to the economic and ecological vitality of the region, given effective recovery action.

The failure of state, federal and tribal agencies to manage these runs and their habitats for continued productivity has resulted in their listing under the ESA. Salmon management has largely been focused on commodity production rather than maintaining the productivity of a diverse ecosystem. Yet, the listed Snake River chinook and sockeye salmon are among many salmon populations from central California to the Canadian border that could be listed under the ESA. Petitions to list coho salmon, steelhead, and cutthroat trout are pending. According to the American Fisheries Society, a professional scientific organization, there are at least 214 stocks of native anadromous

1

To Protect and Restore Native Fish and their Ecosystems

Water Tower Building • 5331 S.W. Macadam • Suite 228 • Portland, Oregon 97201 • (503) 222-9091 • FAX (503) 222-9187



salmon and trout that are at risk of extinction. The entire anadromous and resident salmonid ecosystem is at risk. The Snake River salmon populations are only the tip of what is already an ecological disaster. The problems confronting the Columbia River salmonid populations are not unique in western North America.

II. SUMMARY OF OBSTACLES TO RECOVERY

- The natural productivity of the salmon ecosystem is severely degraded.
- Productivity of coho salmon has declined by 90%.
- Columbia Basin productivity has declined by 97%.
- The 130 year legacy of salmon management strongly suggests it is a failure and requires total reform. This failure is due to the predominate focus on commodity production rather than maintaining a productive ecosystem and the evolutionary potential of the species.
- Land, water, and fish management agencies have conflicting and competing missions.
- While the region plans to spend more than \$350 million on Columbia River salmon recovery per year, there is still no goal.
- There is no agreement among managers to protect native salmon populations and their ecosystems.
- There is no coordinated policy to conserve genetic and life history variation and evolutionary potential of salmon.
- There is no institutional means or technical expertise assembled to establish a strategy or collect the information needed to conserve native salmon populations.
- There is no single authority to implement salmon recovery measures and evaluate the results.

III. RESPONSE TO COMMITTEE QUESTIONS ABOUT THE SNAKE RIVER RECOVERY TEAM PLAN

Oregon Trout reviewed the Draft Recovery Plan and submitted detailed comments (Attachment A). We answer the committee's questions on the Recovery Plan based on those comments.

A. Question # 1:

While Oregon Trout made many critical comments on the draft recovery plan, we concluded that it was the first full life cycle salmon plan and therefore we generally support it. The only other life cycle plan is the Strategy For Salmon recently adopted by the Power Planning Council, but the Council lacks authority to implement its plan. The strengths of the Recovery Plan are: (a) it provides a single authority and accountability in the National Marine Fisheries Service (NMFS) for salmonid recovery coastwide; (b) it establishes a Scientific Oversight Committee so the recovery measures are scientifically driven and evaluated; and (c) it sets sound delisting criteria. Without a recovery plan the region will continue to perpetuate the problems that caused the salmon to be listed.

The weaknesses of the Recovery Plan are its reliance upon technological intervention such as hatchery propagation and smolt transportation. Based on our review of the scientific literature, we view hatchery supplementation as an untested theoretical experiment that should not be broadly applied until evaluated. Any funding should be directed at evaluation of this experimental design and aimed at risk containment. Further, transportation can only be one of the tools used to aid in juvenile migration; it must be used in combination with spill, flow and other methods.

Another major weakness is that the Recovery Plan does not establish an institutional mechanism or commitment that is specific to the recovery of natural stocks. This is evident from the absence of a natural production strategy in the Recovery Plan. We also believe the NMFS is unable, under present funding and staffing, to effectively execute the Recovery Plan. We also believe that NMFS has been a participant in west coast salmon decline and therefore currently lacks the vision that will carry it beyond the status quo. Finally, NMFS cannot, by itself, recover the salmon without the institutional commitment of other federal and state agencies to solve the salmon habitat problems.

Will the Recovery Plan lead to recovery of these stocks? First, the Recovery Plan is experimental; it must be treated as a scientific experiment and is therefore uncertain. Secondly, we know for certain that without a plan the region is unable, on its own, to solve this complex and integrated problem.

B. Question # 2:

Other existing proposals that would increase the likelihood of recovery are Pacfish and FEMAT. They establish habitat conditions that would maintain the productive capacity of salmonids on federal lands. We need to expand these proposals to include non-federal lands. Oregon's wild fish policy could also assist in recovery especially if this policy were adopted and implemented by other states in the region. For example, the state of Washington is developing a Wild Salmon Policy. These state policies aimed at recovery measures for wild salmon and trout populations will help to recover a multitude of populations that are already in the ESA pipeline. The Power Council's Strategy For Salmon should be incorporated into the Recovery Plan, especially section 6.2a which deals with the recovery of natural salmon populations.

Other actions that should be taken include the following:

1. Develop a national policy for the conservation of native fish fauna diversity.
2. Cause each hatchery operating with federal funds to comply with the National Environmental Policy Act. All hatcheries should be licensed so that periodic public review is provided.
3. Implement enforcement and monitoring of non-point pollution standards.
4. Reauthorize the Magnuson Fishery Conservation Act to specifically address meeting standards to provide spawner escapement to maintain the productive capacity of each stock, and thereby the salmon resource as a whole.
5. Restructure hydro dam mitigation to fund biological inventory and habitat protection rather than replace wild

salmon with hatchery fish.

6. Discontinue transportation by truck since the fish that are transported in this way are unable to imprint effectively. They become lost and stray into other watersheds, spreading diseases and disrupting the adaptive capacity of local gene pools.

C. Question #3:

What should be the essential elements of the final Recovery Plan adopted by NMFS? First, the plan should be driven by science and scientific evaluation. It is important to make a distinction between science and process and establish a specific role for both elements in the plan. The Scientific Oversight Committee would establish this. Second, a priority must be placed on completing an inventory of the natural biological diversity of salmonids on the entire west coast. This data can then be used to evaluate the various management and recovery experiments. This would allow the agencies and the public to conduct adaptive management and even describe success. The Recovery Plan lacks this essential element. Third, the priority for management and recovery actions should be placed first on native, natural populations of salmonids, since it is the recovery of these populations that we are all held accountable to under the ESA. The Recovery Plan lacks a specific strategy for recovery of natural, native populations of salmonids.

IV. CONCLUSION:

In conclusion, the nation and the Northwest region of the United States risk losing a culturally and ecologically important asset and an economically important commodity. The region lacks a coherent health plan for native salmonids, a health plan that is imbedded institutionally both among and within federal and state land, water and fish management agencies. Salmon, steelhead, and trout of the west will continue to decline until extinct unless a holistic health care plan based on the genetic and lifecycle needs of wild, natural salmonid populations.



O R E G O N T R O U T

LIST OF ATTACHMENTS FOR THE RECORD

**House Committee on Merchant Marine and Fisheries
Oversight Hearing**

June 30, 1994

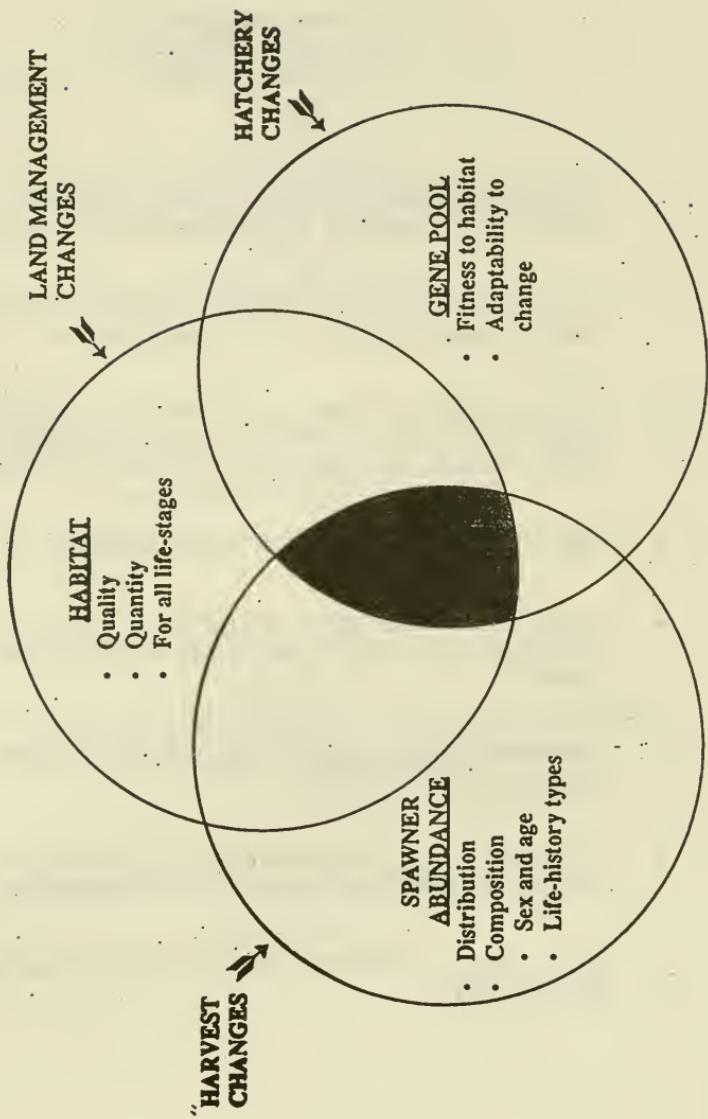
- Comments on the October 1993 Draft Recovery Plan Recommendations for Peer Review. December 5, 1993.
- Proposal for Restoration of Columbia River Salmon: Recommendations for Recovery Under the Endangered Species Act. January, 1991.
- Letter to Mr. Robert Saxvik regarding effects of transportation on wild natural populations. March 29, 1993.
- Memorandum to Environmental Quality Commission on Temporary Rule for TDG in Columbia River. May 16, 1994.
- Comments on hatchery Operations and Juvenile Releases Section 7 Consultation Under the ESA for 1993. June 23, 1994.
- Comments on the Application by Idaho Department of Fish and Game to Individual Incidental Take Permit Under the ESA. February 7, 1994.
- Managing for Productivity: A New Strategy for Pacific Salmon Recovery. Bill M. Bakke. Trout: The Journal of Coldwater Fisheries Conservation. Summer 1993.
- Better Roles for Fish Stocking Programs -- Human Behavior, Fish Behavior, and the Status of Northwest Salmon. Ray J. White, Willa Nehlsen, James R. Karr. August 1993.
- Techno-Arrogance and Halfway Technologies: Salmon Hatcheries on the Pacific Coast of North America. Gary K. Meffe. Conservation Biology. April 1992.
- Genetic Interactions Between Hatchery and Wild Salmonids: Lessons from the Pacific Northwest. Robin S. Waples. Can. J. Fish. Aquat. Sci. Vol. 48. 1991.

To Protect and Restore Native Fish and their Ecosystems;

Water Tower Building • 5331 S.W. Macadam • Suite 228 • Portland, Oregon 97201 • (503) 222-9091 • FAX (503) 222-9187



Requirements of Self-sustaining Fish Populations



GUIDING PRINCIPLES
OF SALMON AND TROUT
CONSERVATION

- THE PRODUCTIVITY OF WILD SALMON AND TROUT POPULATIONS MUST BE MAINTAINED AND INCREASED
- THE EXTINCTION OF ANY WILD SALMONID POPULATION IS AN IRREVERSIBLE LOSS OF GENETIC RESOURCES.
- MANAGEMENT ACTIONS MUST MAINTAIN THE GENETIC STRUCTURE AND LIFE HISTORY CHARACTERISTICS OF POPULATIONS AND THEIR EVOLUTIONARY POTENTIAL.
- THE UNIT OF CONSERVATION IS THE POPULATION.
- HABITAT RESTORATION MUST RECLAIM THE LINKAGE BETWEEN THE LIFE HISTORY NEEDS OF THE ANIMAL AND ITS HABITAT.
- THE INDUSTRIAL MODEL OF RESOURCE MANAGEMENT DEFEATS CONSERVATION
- WATERSHEDS ARE THE STOREHOUSE OF GENETIC MATERIAL AND GENE CONSERVATION IS THE FUNDAMENTAL CONCERN.
- WE CANNOT AFFORD TO LOSE ANY MORE SALMONID BIODIVERSITY.

Testimony of
AL WRIGHT
Executive Director
Pacific Northwest Utilities Conference Committee
One Main Place
101 SW Main
Suite 810
Portland, OR 97204
503-223-9343

Regarding
COLUMBIA RIVER SALMON

Before the
SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES
Committee on Merchant Marine and Fisheries
U.S. House of Representatives

June 30, 1994
Washington, D.C.

Chairman Studds, Members of the Committee, my name is Al Wright. I am the Executive Director of the Pacific Northwest Utilities Conference Committee (PNUCC). PNUCC is a non-profit association of public and private electric utilities and direct service industries in Oregon, Washington, Idaho and Montana. We represent the three major Bonneville Power Administration customer groups on regional power and environmental issues. I appreciate the opportunity to express our views on the final recommendations of the Snake River Salmon Recovery Team.

There are only two legitimate recovery plans on the table for recovering endangered salmon stocks. One is the Northwest Power Planning Council's 1994 Fish and Wildlife Program, developed under the auspices of the Northwest Power Act. The second is the Snake River Salmon Recovery Team's Final Recommendation to the National Marine Fisheries Service (NMFS) completed in May 1994. This Recovery Plan was developed by seven credible scientists appointed by NMFS under the Endangered Species Act.

We believe that both plans have merit. From the beginning of the Recovery Team's work, PNUCC has been willing to support a plan developed by seven objective scientists. We were willing to give it a chance to work and endorsed the plan before we even saw it because we believe that a plan based on sound biology is our only chance of saving the salmon. That position remains unchanged. We believe the Recovery Team's recommendations are grounded in science and will lead to recovery of the stocks.

No plan, however, will recover the salmon stocks overnight. There are simply no overnight fixes. It will take time. One of the most important things the region needs now

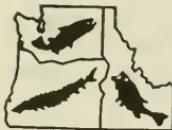
is patience. We need to put a plan in place and leave it alone long enough to let it work. And while the plan is in place, we need good monitoring and evaluation.

The Recovery Team's Plan takes into account a comprehensive, broad-based approach and covers the "4-Hs" -- Habitat, Harvest, Hatcheries and Hydro. Any credible and effective plan must have these elements which address each life stage of the salmon. Both the Recovery Team's recommendations and the Council's Program include them and the final recovery plan should meld the key components of the two plans.

PNUCC cannot ignore the long-term economic impacts. We are currently spending \$350 million a year on fish recovery and any recovery plan will be far more expensive. So as we implement the Recovery Plan we need to figure out just what are the long-term impacts and what can be done to abate them. One suggestion from us is to redirect existing money now being spent on lower priority fish and wildlife activities and re-invest it on sound Recovery Plan measures. This will require a detailed and "hard-nosed" review of our existing Fish and Wildlife expenditures.

One thing that can be done immediately is for NMFS to adopt the Recovery Plan's recommendation to form a Scientific Oversight Committee. We have a recent example of NMFS doing just this and it was a success. NMFS formed an international panel of experts to resolve a controversial issue of fish mortality caused by nitrogen supersaturation levels from spill. These scientists reviewed up-to-the-minute monitoring reports and recommended actions to NMFS based on their conclusions. This is a good example for the future.

We all need to commit to a scientifically based recovery Plan and have the patience to let it work. Once it is in place we must continue to monitor and evaluate its effectiveness. But let's stop playing with "warring plans" and adopt one, marry the Team's recommendations to the Council's Fish and Wildlife Program and get on with salmon recovery.



**NORTHWEST
SPORTFISHING
INDUSTRY ASSOCIATION**
PO. BOX 4, OREGON CITY, OR 97045

CHAIRMAN

Phil Jensen

PRESIDENT

Guy Schoenborn

VICE PRESIDENT

Tom Posey

The Tom Posey Co.

SECRETARY

John Martinis

John's Sporting Goods

TREASURER

Mark Masterson

Worden's/Yakima Bait Co.

DIRECTORS

Walt Hummel

Lewis River Sporting

Goods

Rich Kato

Farwest/Sports Services

Tom Harger

John B. Merfield Co.

B.G. Eilerston

G.I. Joe's

Buzz Ramsey

Luhr Jensen & Sons

EXEC. DIRECTOR

Liz Hamilton

ADVISORY BOARD

Art Simpson

Bill O'Loughlin

Bob O'Leary

Bob Maschinski

Bob McRobbin

Chuck Forstrand

Den Grogan

Diane Sipei

Dick Posey

Frank Amato

George Endress

Jeff Morton

Jim Diehl

Jim Teeny

John Schnass

Jon Englund

Kevin Morris

Kim Jelinek

Layne McGowan

Mike Klett

Mike Chamberlin

Mike French

Milt Gussell

Rhonda Hamstreet

Robert Beatty

Roy Withey

Ron Sultz

Steve Danielson

Stuart Meier

Tom Nelson

Vernon McPherson

Statement
of

Liz Hamilton,

Executive Director

Northwest Sportfishing Industry Association

before the

Committee on the Merchant Marine and Fisheries

Hon. Gerry Studds, Chairman

US House of Representatives

at a hearing on

Salmon Recovery in the Columbia/Snake River Basin

June 30, 1994

Good morning Mr. Chairman and Committee. I wish to thank members of the committee for this opportunity to address the issues surrounding salmon recovery in the Columbia River Basin. My name is Liz Hamilton, and I serve as the Executive Director for the **Northwest Sportfishing Industry Association** which represents hundreds of businesses and thousands of jobs in the Pacific Northwest and beyond. From "worms to downriggers", from major retailers to "mom & pops", the men, women and businesses working with NSIA are dependent on and dedicated to a healthy salmon resource. In Oregon and Washington alone, the sportfishing industry generates \$3 billion annually to the overall health of the states' economies.

Sportfishing businesses are as diverse and as geographically disbursed as the fish we rely upon. Traditionally, we have placed our focus upon partnerships dedicated to sportfishing promotion and habitat restoration. The formation of **NSIA** was in recognition that decisions regarding the resource we depend upon were very much impacted by other industries. We organized and became involved to be a united and positive voice for the salmon recovery our businesses require for a healthy future.

The charters and guides, bait houses, marinas, marine suppliers, shopping centers, wholesalers, retailers, distributors, manufacturers, and manufacturers representatives that NSIA represents, view the declining salmon and steelhead runs on the Columbia River as a driving force in **business closures and failures** in both sportfishing

and commercial businesses along the west coast from northern California to Alaska. In addition, our businesses inland, from manufacturing to retailing across the United States are severely impacted, by the loss of millions of salmon in the Columbia System.

Fishing closures and restrictions will continue to impact our economy with *hundreds of millions of lost dollars* until the operation of the hydro system is substantially altered for fish passage. Years of data collected and studied by State, Federal and Tribal biologists have shown direct and substantial correlation between years of high flow and spill with increased adult returns. Smolt monitoring done by the fish passage center confirms and reinforces the original flow/survival studies of the 1970's and 1980's.

Our salmon populations in the Columbia basin are facing a crisis of historic proportions. The Columbia once was the largest salmon producing river in the entire world, with some 10 to 16 million returning adults.

This year, we anticipate returns of 1.2 million fish, a more than ten-fold decrease, of which only one-quarter are wild, naturally spawning fish. The Snake River wild spring Chinook once numbered over 60,000 spawning adults. This year less than 1000 are expected back to their spawning grounds. Predictions for next year are worse!

Will we choose to allow these resources and the industries that depend on them to disappear?

In reviewing the Bevan Plan, it becomes immediately apparent that the lower Columbia commercial fishing interests have been determined to be expendable. The decline of stock abundances and a lack of serious changes in the management of the hydro-system, sends a clear message that the sportfishing industry is also expendable. With the treaty fisheries "on the beach", all harvesters, seem to be written out of the equation.

It appears that the resource and those dependent on a healthy fishery are not a priority. One remembers the analogy: "When they came for the Gillnetters, I did not protest, because I was not a Gillnetter. When they took out the tribal nets, I did not speak up because, I was not an Indian. When they took my rod and reel, there was no one left to protest." Fishers realize that getting rid of their traditional adversaries won't save the fish, only changes in human activity will.

When considering the economic benefits to the region of healthy fish populations, the corresponding industries dependent on salmon, must be a part of the equation. Remember, there is a G.I. Joes, a Fred Meyer, a Bi-Mart, and a hardware store selling tackle ***in virtually every community in the Northwest***. Expand that to include boat dealers, manufacturers distributors, marinas, resorts and motels, and you begin to see the magnitude of the value of the elusive salmon to the Pacific Northwest. In the **NSIA**

database, there are nearly 5,000 businesses both large and small, related to sportfishing in the Northwest. They are located throughout every congressional district.

These disappearing fish represent lost, renewable dollars to this region. Salmon fishing dollars are salmon fishing dollars. In failing to make the bold decisions necessary to recover salmonids in the Columbia Basin, we are systematically exporting industry to Canada!! An article written by Bill Clarke of the *Northwest Marine Trade Association* reveals a decline in Washington license sales, with a corresponding increase in British Columbia for the last several years. In one year, (1991) \$58 million dollars left the state of Washington to be spent north in pursuit of Salmon.

The collapsing stock numbers are a disaster to the Northwest economy as well. Let us examine the recreational salmon fishery at Buoy 10 in 1987, a year when the high numbers of adult returns were a direct translation from the years of high flow in spill in the mid-1980's. According to figures supplied by PFMC, the Buoy 10 recreational fishery (OR, WA, and area 4B add-on) created local personal income impacts of over \$8 million dollars in a fishery that lasts, on average, four weeks!!

Not included in the eight million dollar figure are the other expenditures for the fishery, such as: tackle, boats, motors, trailers, rods, reels, food, beverages and other purchases that support our industry. Nor do these figures reflect ANY other recreational fisheries that the Columbia supplies such as Spring Chinook or Steelhead.

Contrast these figures with the personal income impacts from 1993 of \$2.9 million. A nearly 2/3 reduction is directly related to the decline in status of the Columbia River stocks. BPA, State & Tribal Agencies and the Bevan Team recognize and acknowledges that the operation of the hydro-system is a major destroyer of juvenile and adult migrants.

The relevant question we must ask is not "How much will it cost to save our salmon?" The real question is "**How much will it cost to do nothing?**"

Salmon closures, alone, will not restore the Columbia's historically famous fisheries. NSIA and anglers do not want to fight over or harvest the last fish, and have supported restrictions on gear, harvest timing, and catch and release to protect weak stocks. However, cutting back on harvest, year after year, without addressing the root of the problem, is the same as making the "Victim" pay for restitution.

The National Marine Fisheries Service Snake River Recovery Recommendations fail to address many of the fundamental changes that are necessary for healthy salmon populations. In addition to a reliance on barging rather than in-stream migration, (through flow and spill regimes) the plan still only "tinkers" with the hydro system, with no accountable modification schedule for the dams.

The recovery recommendations are too narrow in scope, only addressing the Snake River Basin, when basin-wide management would benefit all Columbia River Salmon. For healthy fish populations, an ecosystem approach will need to be implemented. Operating John Day Reservoir at minimum pool is not endorsed Most noteworthy, the Plan rejects input of state and tribal agencies, a practice which has already landed NMFS in court, and should not be continued. Judge Marsh set aside the old Jeopardy standard. We are discussing a plan that will likely be inadequate to meet a revised standard.

NSIA and many scientists have serious doubts in regard to the barging programs. In reversing the precipitous declines, the 18-year barging experiment has worked about as well as a Band-Aid would for a cancer. As the current fish numbers indicate, barging has proven to be a failed experiment. Each year the number of barged fish has increased and each year the number of adult returns has decreased. The ONLY years that produced higher adult returns were the years when high flows and the resulting spill, transported the juveniles in-river.

Fish were never meant to travel in barges or down freeways to the ocean. Barging has been an excuse to deny what fish really need--flowing water and clear passage to the ocean. Fish traveling in-river and spilled over the dams suffer a less than 2% mortality. Fish traveling through the turbines have been shown to die at the rate of 10-30 percent at each facility.

Central to the health of our salmon populations on the Columbia, and our businesses from Northern California to Alaska is the requirement of the migrants, both juvenile and adult, for adequate flows to facilitate in-stream migration. With our salmon populations crashing and at "condition red," further studies on a salmon's absolute need for increased flows cannot be interpreted other than as a death sentence for these populations.

Such dire circumstances, brought on by existing hydro-practices, demand immediate and bold actions on the part of the Corps of Engineers and the National Marine Fisheries Service. It is mandated that the NPPC identify measures by which to protect salmon runs from being destroyed by the Snake and Columbia Dams and to "provide flows of sufficient quality...to improve production, migration and survival."

These flows need to be hard constraints, and incorporated into power planning in order to ensure that fish flow velocities will actually be met. Even though a critical range of flows to help migrants successfully survive has been identified with the best technical advice from regional agencies and tribes, these "targets" have not been met historically. The result of inaction is before us now.

Increased flow produces a multitude of benefits to migrating fish including:

- Moving juveniles successfully in-stream. Years in which spill and high flows were combined translated into years of high adult returns. Management of Snake river reservoirs, under normal operations, slows water particle travel time five fold, greatly increasing smolt travel time.
- Flow volumes facilitate and stimulate adult up-stream migration.
- Increased flows can help lower deadly summer water temperatures harmful to both juvenile and adult migrants. According to the studies cited in the 1994 DFOP, "water temperature is strongly and negatively correlated with flow".
- Shortened travel times induced by higher flows will reduce predation in several ways: Foremost, a lessened travel time translates into less exposure to predators. Flow disbursts predators into the slack waters they have a preference for. Increased flow would conceivably save a great deal of money currently spent on predator control!!
- Increased flows combined with a carefully monitored spill program, would allow for the majority of juveniles to successfully travel in-stream, reducing or eliminating funds spent on the failed barging experiments.

Further studies in lieu of action combined with studies appear to be another attempt at delay and "**paralysis by analysis**" The crashing fish populations that we are forced to deal with can no longer be placed on the backs of the fishing industry. Our sacrifices in harvest have not returned to us with increased numbers of fish. The fish cannot afford further delay with studies and continuation of the "status quo", nor can our industry. As was eloquently stated at the Fish Operations Executive Committee meeting of the Northwest Power Planning Council on 20th, "We have exhausted all of the easy choices. We are down to the hard choices."

NSIA concurs, the waters of the Columbia need to be managed with more balance, giving more of its flow and water to ensure the survival of our once historic salmon populations. In addition to flow, **NSIA** recognizes spill as the safest way to spread the risk and facilitate safe, in-stream migration for migrants.

The spill program is the best near-term option to improve survival of juvenile migrants. ODFW and other fishery analysts show that spill would double the survival of the juveniles migrating in river. While dissolved gas can be a problem, this program is coupled with a detailed and effective monitoring program to detect and correct any occurrences of gas bubble trauma.

The spill program DID not to produce any dissolved gas levels that are not already commonly occurring in routine operations of these dams. In fact, the levels of dissolved nitrogen and gas bubble trauma were less in most instances than last year, when NO objections were raised to spill.

The real issue of concern, is not the "smokescreen" issue of gas bubble trauma. Without a doubt, there has been many times in the past where operation of the hydro-system was in violation if DOE standards. The real issue here in the minds of the

Board of Directors of NSIA and the businesses that we represent is **How is it that it took a federal court case by the states and tribes to get the desperately needed spill for fish survival and enhancement?**

This spill program is the first ray of light and hope for an industry that, until recent closures, generated billions of dollars in income to this region. The fish, and the industries I represent are waiting for the promises made when the dams went in to be kept.

In addition to the value to the region that healthy salmon populations represent, it is important to remember the social and cultural values that sportfishing represents. Outdoor, fishing activities are **family bonding** events. Think back, . . . dig through your photo album. I am certain that, for many of you, your earliest, fondest memories were in the outdoors, fishing rod in hand.

Several weeks ago, I taught beginning fishing at a 3 day seminar titled "Becoming an Outdoor Woman". The seminar was attended by nearly 100 women from Oregon, Washington and Northern California. On Saturday night, a great salmon barbecue was prepared and served by volunteers from the Oregon Department of Fish and Wildlife. Before the salmon was served, a ceremony of thanks was given.

A "thank you to salmon for returning" was presented by a tribal representative, a child, a sport angler, a commercial representative, and a fish processor. After the thanks were offered, there were very few dry eyes at dinner, and my eyes were flowing freely. I know that we were all mourning the very real possibility of extinct salmon populations.

The Northwest has been described as, "any place that a salmon could get to". Are we now to redefine ourselves as "the place where salmon used to be?" This is simply not necessary. We have the building blocks required for Salmon recovery. In addition to Judge Marsh, the Northwest needs other leaders to embrace and implement the changes that will take the salmon and our industries into the future.

The Northwest Power Planning Council's Strategy for Salmon should be a starting point, with modifications and recommendations from tribal and state agencies. The Northwest does not need another "spotted owl nightmare". Between the NPPC Strategy for Salmon, the Detailed Fish Operations Plan and the NMFS recovery recommendations, we can develop a recipe for recovery. Let's stop the blame game, and work together on the difficult solutions to which we all must contribute to be successful in restoring our salmon to harvestable abundances.

NORTHWEST SPORTFISHING INDUSTRY ASSOCIATION

(Partial listing as of 6-24-94)

A LURE FLY CO	ABU-GARCIA	ACME TACKLE
ACTIVE MARKETING	AL'S LANDING	ALASKA F&G SPORT FISH DIV.
ALASKA PREMIER BAIT	ALL-SPORTS SUPPLY, INC.	ANCHOR RITE
ANDE MONOFILAMENT	ANGLERS GUIDE SERVICE	ASSN OF NW STEELHEADERS
AUBURN SPORTS & MARINE	B & E SALES COMPANY INC	BATES & ASSOCIATES
BETTY KAY CHARTERS	BI MART	CAMBO'S OUTDOORSMAN
CATCHER CO.	CHENEY SPORTS	COGHLAN'S LTD
COMPLEAT ANGLER	COVE PARK GROCERY & TACKLE	CRAN-MAR TROUT FARM
CRANE PRAIRIE RESORT	D & D DISTRIBUTING	DANIELSON CO.
DENNIS REPRESENTATIVE CO.	DEPOE BAY TRUE VALUE	DIANA SMITH LTD
DONALD P. HARRY INC	DUFFLE BAG, THE	EMBARCADERO DOCK
ENGLUND MARINE SUPPLY	FARWEST SPORTS	FISHERMAN'S MARINE SUPPLY
FOLBE PRODUCTS	FRANK AMATO PUBLICATIONS	FRED MEYER INC
G I JOE'S INC	G. LOOMIS, INC	GAMAKATSU USA
GAMBLER BOATS WEST	GUNARAMA WHOLESALE	H & H OUTDOOR
HANSEN'S FURNITURE CO.	HILDEBRANDT CORP	HOLIDAY MARKET
HOLTHE WALLS ASSOCIATES	HOOKER INVESTMENTS	HUNGRY WHALE
ILWACO CHARTER BOAT ASSN	J & K OUTFITTERS	JERRY'S SURPLUS
JOHN B. MERIFIELD, INC	JOHN'S SPORTING GOODS	JON B. CASH LTD
K T MORRIS & ASSOCIATES	KINGFISHER ENTERPRISES	KLIEN HONDA
L.H. FRENCH CO	LAMIGLAS INC	LEISURE SALES, INC.
LEWIS RIVER SPORTS	LINDSAY & ASSOCIATES	LUCKY ONE
LUHR JENSEN & SONS	MACK'S LURE MFG CO	MASCHMEDT & ASSOCIATES
MAX MORTON COMPANY	NARROWS MARINA	NESTUCCA VALLEY SPTG GOODS
NEWPORT MARINA STORE	NEWPORT TRADEWINDS	NORTH WEST TACKLE SUPPLY CO
NORTHWEST EYE CLINIC	NORTHWEST OUTFITTERS SUPPLY	O'LOUGHLIN TRADE SHOWS
OLSON'S RESORT	OUSLEY SPORT SHOP/SHAMROCK	OWEN BROWN & ASSOCIATES
PACIFIC SALMON CHARTERS	PEAK SALES & MARKETING	PENN FISHING TACKLE MFG
PERKINS VARIETY APPLES	PHIL'S SPORTING GOODS	PORT GARDNER SPORTS SERVICE
POULSBO SPORTING CENTER	POULSEN CASCADE	PRICED LESS
PRO SPORT DISTRIBUTING	PUGET SOUND ANGLERS	PUGET SOUND ANGLERS, WHIDBE
REEL NEWS, THE	RICHLAND ROD & GUN	RITCHIES CUSTOM TACKLE
RIVERS WEST GUIDE SERVICE	RON'S CUSTOM FISHING RODS	S & S GUIDES
SALTCHUCKER CHARTERS	SAMS RV PARK/FALLS BAY	SCOTTY DOWNRIGGERS
SEA SPORT CHARTERS	SEAVIEW CHEVROLET	SECOMA TACKLE/ROD&REEL
SHELDONS', INC.	SIBERIAN SALMON EGG CO	SILVER HORDE FISHING SUPPLIES
SNAPPER TACKLE CO.	SPECIALTY ADVENTURES	SPORTS SERVICES INC
STORM MANUFACTURING	SUNBIRD SHOPPING CENTER	SUNRISE GUIDE SERVICE
SWAIN'S GENERAL STORE, INC.	T.H.E. TACKLE	TED'S SPORT CENTER
TEENY NYMPH CO.	THE TOM POSEY CO.	THOMPSON & ASSOCIATES
TIM BAILEY & ASSOCIATES	TIMSEN CO INC	VMC, INC.
WESTERN SPORTS & LEISURE	WESTERN STATES ASSOCIATES	WILDCAT STEELHEAD CLUB
WILLIE BOATS, INC	WILSON MARINE SERVICE	WINCHESTER BAY MARKET
XTRACTOR ENTERPRISES	YAKIMA BAIT CO.	YAMAGUCHI DISTRIBUTING
ZAK TACKLE MFG CO	ZEBCO CORPORATION	ZOG'S BAIT HOUSE

NSIA has been awarded an Environmental Quality Grant from
American Sportfishing Association

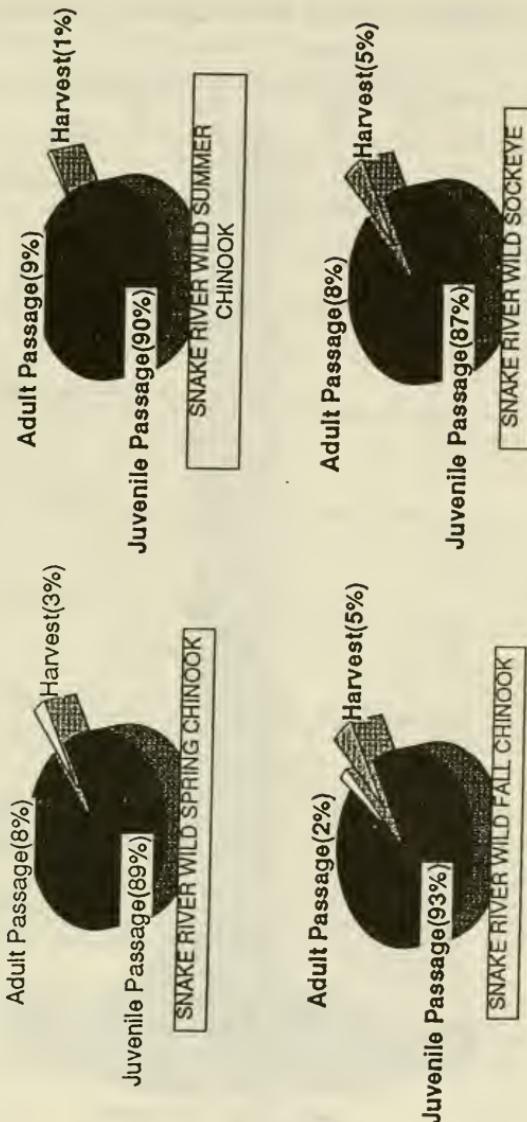
APPENDIX B: Economic Impact of Sport Fishing in the United States by State for 1991

State	Angler Expenditures	Economic Output	Earnings	Jobs	State Sales Tax	State Income Tax	Federal Income Tax
Alabama	\$493,183,000	\$1,010,062,000	\$295,863,000	16,928	\$19,727,000	\$9,419,000	\$30,284,000
Alaska	344,802,000	580,677,000	133,128,000	6,727	No tax	No tax	17,383,000
Arizona	810,475,000	560,443,000	165,436,000	8,801	13,574,000	4,602,000	17,461,000
Arkansas	394,166,000	767,734,000	203,759,000	13,233	17,737,000	3,284,000	19,305,000
California	1,500,222,000	3,182,633,000	917,406,000	40,246	90,013,000	18,363,000	103,996,000
Colorado	332,105,000	687,702,000	199,698,000	10,511	9,963,000	7,068,000	21,169,000
Connecticut	213,297,000	425,229,000	138,489,000	5,385	12,798,000	1,106,000	16,393,000
Delaware	59,709,000	107,326,000	29,345,000	1,605	No tax	819,000	3,064,000
Florida	1,927,246,000	3,473,339,000	1,080,987,000	58,018	115,635,000	No tax	113,773,000
Georgia	448,420,000	951,695,000	288,516,000	14,697	17,937,000	6,021,000	21,991,000
Hawaii	90,385,000	163,612,000	48,478,000	2,461	3,615,000	2,447,000	5,215,000
Idaho	163,251,000	295,622,000	88,223,000	5,371	8,163,000	3,357,000	8,599,000
Illinois	606,630,000	1,417,777,000	417,334,000	18,839	37,914,000	9,384,000	46,984,000
Indiana	330,833,000	684,576,000	199,256,000	11,879	16,042,000	4,533,000	20,004,000
Iowa	206,084,000	398,768,000	111,844,000	6,887	8,243,000	2,845,000	11,026,000
Kansas	257,058,000	537,089,000	146,844,000	8,160	10,925,000	4,570,000	15,210,000
Kentucky	422,501,000	905,978,000	243,997,000	13,934	25,350,000	7,213,000	25,025,000
Louisiana	622,034,000	1,248,569,000	330,282,000	18,404	24,881,000	5,445,000	34,138,000
Maine	190,114,000	336,394,000	106,165,000	6,341	11,407,000	3,151,000	10,628,000
Maryland	275,412,000	525,848,000	171,933,000	8,341	13,771,000	5,789,000	18,878,000
Massachusetts	401,009,000	766,872,000	238,369,000	10,445	20,050,000	11,274,000	27,063,000
Michigan	1,073,487,000	2,051,580,000	628,569,000	31,079	42,939,000	20,986,000	56,405,000
Minnesota	803,746,000	1,643,782,000	473,833,000	26,466	52,243,000	19,618,000	49,121,000
Mississippi	236,126,000	489,402,000	131,233,000	8,743	14,168,000	2,871,000	12,424,000
Missouri	456,331,000	961,212,000	266,771,000	15,348	19,280,000	7,442,000	27,227,000
Montana	157,469,000	300,432,000	80,382,000	5,818	No tax	1,736,000	7,220,000
Nebraska	105,143,000	206,195,000	59,958,000	3,720	5,257,000	1,280,000	5,656,000
Nevada	64,864,000	105,355,000	31,420,000	1,568	4,216,000	No tax	3,404,000
New Hampshire	99,358,000	178,175,000	53,762,000	2,972	No tax	No tax	5,896,000
New Jersey	630,930,000	1,326,021,000	402,157,000	16,754	44,165,000	6,184,000	46,425,000
New Mexico	129,116,000	232,129,000	60,788,000	3,806	6,456,000	954,000	5,953,000
New York	836,311,000	1,557,552,000	438,223,000	18,950	33,532,000	19,429,000	49,952,000
North Carolina	628,618,000	1,265,998,000	375,184,000	21,793	25,145,000	15,254,000	38,160,000
North Dakota	45,971,000	83,747,000	22,354,000	1,541	2,299,000	391,000	2,074,000
Ohio	722,166,000	1,530,084,000	445,512,000	34,236	36,108,000	4,742,000	46,630,000
Oklahoma	387,336,000	793,506,000	208,309,000	11,606	17,430,000	3,946,000	21,541,000
Oregon	489,061,000	949,694,000	254,282,000	15,570	No tax	15,418,000	29,371,000
Rhode Island	70,062,000	125,053,000	40,718,000	2,157	4,904,000	1,186,000	4,112,000
Pennsylvania	486,434,000	1,080,112,000	315,007,000	16,087	29,186,000	6,320,000	33,847,000
South Carolina	366,579,000	709,455,000	216,412,000	13,546	18,329,000	5,820,000	21,186,000
South Dakota	79,427,000	145,133,000	42,899,000	2,943	3,177,000	No tax	3,985,000
Tennessee	499,697,000	1,051,483,000	313,116,000	16,953	27,483,000	No tax	32,876,000
Texas	1,165,999,000	2,792,435,000	733,634,000	38,740	72,075,000	No tax	77,712,000
Utah	163,225,000	335,666,000	93,319,000	5,884	8,161,000	3,752,000	9,114,000
Vermont	70,514,000	125,518,000	37,920,000	2,370	3,536,000	1,043,000	3,723,000
Virginia	565,664,000	734,361,000	221,152,000	11,780	12,798,000	6,258,000	23,372,000
Washington	983,218,000	1,831,745,000	555,803,000	27,020	63,909,000	No tax	60,890,000
West Virginia	104,329,000	178,140,000	51,133,000	3,377	6,260,000	972,000	4,849,000
Wisconsin	857,262,000	1,757,480,000	503,032,000	30,351	42,614,000	18,160,000	50,201,000
Wyoming	117,561,000	212,421,000	52,641,000	3,870	3,527,000	No tax	4,687,000

Source: Sport Fishing Institute.

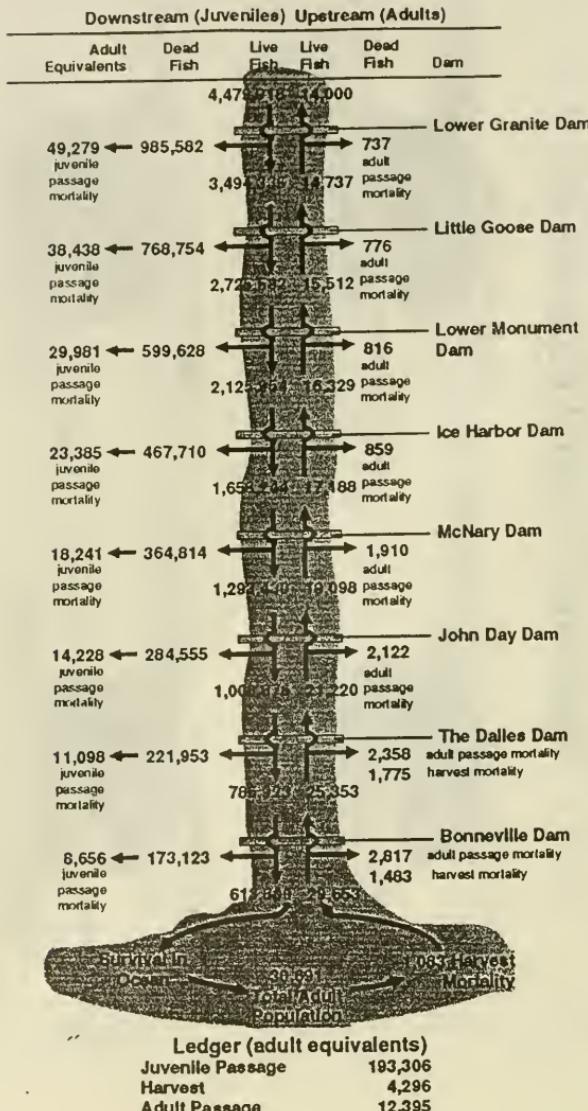
1994. Prepared By: A. J. Fedler and D M Nickum, Sport Fishing Institute 1010 Massachusetts Ave NW, Washington, D C 20001. This project was funded by the U. S. Fish and Wildlife Service under Cooperative Grant Agreement No. 14-48-0009-93-1248 using Federal Aid in Sport Fish Restoration administrative funds.

Human Induced Causes of Immediate Mortality For Columbia River ESA Salmon Measured in Adult Equivalents



HARVEST FIGURES INCLUDE TRIBAL, COMMERCIAL AND SPORT CAUGHT FISH
 WATER, (FLOW DURING JUVENILE MIGRATION) NOT HARVEST IS THE PROBLEM !!

Snake River Wild Spring Chinook



The Ones, Fives, Tens and Twenties That Got Away The "Export" of Washington's Recreational Fishing.

In almost every issue, Washington's fishing publications feature articles and advertisements on salmon fishing in British Columbia and Alaska. Boat dealers around Puget Sound organize yearly salmon derbies in British Columbia for their boat-buying customers. Boat and outdoor shows feature workshops on fishing trips outside the state of Washington. While these events seem relatively innocuous, statistics on the flight of Washington residents to fish in British Columbia and Alaska demonstrate an alarming trend that threatens the health of recreational fishing businesses in our own state.

In part, the problems of recreational salmon anglers have become muted. While commercial salmon anglers gain press coverage and sympathy due to shortened seasons, fewer fish, and increased unemployment in Washington state, recreational anglers only grumble a bit as they go to British Columbia or Alaska. Despite the crisis surrounding Washington's salmon, the recreational angler can still find salmon somewhere. But it's hard for people in Olympia to hear the complaints of Washington anglers who are all the way up in Campbell River or Barkley Sound.

Left to sit at home, however, as their usual customers flee to more fruitful fishing grounds, are the thousands of recreational fishing businesses in Washington. Tackle shops, charter boats, sporting good stores, boat dealers, and marine accessory stores depend on Washington residents who equip themselves, and fish, at home. The economic connection is not a difficult one to see. Instead of owning a boat and using it in Washington, an angler will use a boat furnished by a fishing lodge or guide company in British Columbia or Alaska.

Lack of fishing opportunity in Washington means that state residents have one less reason to buy a boat. Many of the fishing purchases will occur near out-of-state fishing grounds as anglers purchase fresh bait and whatever else the fish are biting on - and of course, purchase things they could have picked up at home.

The difficulty in reversing the northern migration of Washington anglers comes largely because of the multitude of issues, both political and biological, that have caused it to occur. In many cases, Washington anglers travel to Canada and

Alaska to catch salmon of Washington origin.

As an example, consider the harvest of Skagit River and Hood Canal coho over the three year period 1988 - 1990. 58% of the Skagit and 41% of the Hood Canal coho were harvested in Canada. Puget Sound commercial nets, Tribal and Non-Tribal, took approximately 41% of Hood Canal and 25% of the Skagit coho harvest. Washington's sport fishery harvested about 10% of the fish from each system.

In part, Canadian interceptions of Washington-origin salmon are allowed in exchange for the harvest of Canadian-origin sockeye and pink salmon by Washington commercials. But also, Canadian harvest of Washington salmon helps correct the imbalance caused by the Alaskan harvest of Canadian fish. The U.S./Canada Treaty recognizes two countries, not two states and provinces.

The most pressing problem facing recreational anglers in Washington is not who gets the fish, but how many fish there are to get. Another situation exacerbating the flight of Washington anglers northward are feeding conditions in Puget Sound and the Pacific Ocean. Warm ocean currents, known commonly as El Nino, have disrupted the food chain.

Salmon have suffered not only from the scarcity of food but from the need to travel further north to find it. In addition, warm ocean currents have increased the population of predatory fish that target salmon. While El Nino situations will return periodically, it has unfortunately reappeared when habitat loss has made Washington's salmon population most vulnerable.

Washington's recreational anglers are also part of the food chain. As salmon travel north, so do families, vacation days, and dollars.

The increase in Washington residents purchasing British Columbia and Alaska fishing licenses demonstrates this "export" of Washington's recreational fishing economy:

Year	British Columbia	Year	Alaska
1987	29,227	1988	19,314
1988	31,688	1989	unknown
1989	38,014	1990	unknown
1990	44,148	1991	19,295
1991	47,567	1992	23,638

In addition, consider that the average non-Canadian angler visiting British Columbia in 1991 spent \$676.08 per year, not including transportation. In Alaska, non-resident anglers spent an average of \$172.48 per angler day in 1988 not including transportation.

Assuming a fishing trip to Alaska included four days of fishing, Washington residents spent about \$13 million dollars to fish in Alaska during 1991, not including transportation. In British Columbia expenditures from Washington anglers topped \$32 million, not including transportation.

While many Canadian license holders are fishing out of Washington ports, and some can fish relatively inexpensively using their own boats and RVs, other trips can cost in excess of \$1,000 per day. If an average transportation cost of \$200 round trip is assumed for each of these anglers leaving Washington, another \$13 million is spent. This brings the total for fishing expenditures by Washington residents to fish Alaska and British Columbia during 1991 to over \$58 million dollars.

Not surprisingly, as Washington citizens have fished more in British Columbia and Alaska, purchases of resident salmon licenses in our own state has been declining.

Year	Washington Resident Salmon Licenses
1989	334,548
1990	325,207
1991	313,466
1992	265,574

These statistics are not intended to create feelings of guilt among those of you who have ventured North in pursuit of salmon. The point is not to create guilt but to recognize that the success of Washington's recreational fishing businesses follows the health of our fish resources. Statistics such as these showing the increasing flow of dollars out of Washington make a convincing argument that economics must be one of the primary factors in fisheries management.

Past studies on the economics of fishing in Washington have underestimated the contributions of the recreational fishing industry. Even though 80% of all recreational boats in Washington are used for fishing, some studies did not include the purchase of boats as an economic factor associated with fishing. (In 1991, Washington residents spent \$106 million on boats used for fishing). Others assumed that without recreational fishing, Washington residents would spend their money on another form of in-state recreation.

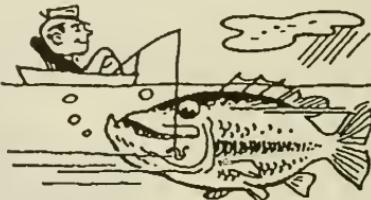
But when statistics on the increasing flight of Washington residents to fish out-of-state are considered, it is evident that Washington's anglers will spend money to fish - they'll just go to where the fish are. As ocean salmon fishing in Washington hits its lowest ebb in history, Washington resident's demand for salmon fishing will in part be relieved by fishing in British Columbia and Alaska.

Considering the health of Washington's salmon runs, fisheries managers face great challenge in protecting and enhancing weak stocks while creating benefit for Washington's citizens and businesses from available salmon resources. It is crucial that during this ecological and economic crisis, the businesses dependent on recreational fishing unite with fishing clubs to have a strong voice where it is needed.

A TRFC member I spoke with recently made an excellent observation concerning the lack of quality sportfishing in Washington: "If the fishing were great, I'd be out fishing. But it isn't and so I'm going to spend my time writing letters and making phone calls to Olympia and Washington D.C. until it gets better." If you're trying to figure out what to do with the time you would have spent ocean salmon fishing this year, maybe the best thing to do is to use some of it to let legislators and agencies know how important fishing is to you and your family.

Ocean conditions for salmon are cyclical and will change. Other issues, from habitat to hydroelectric power require the constant input of anglers to be resolved to the benefit of our fish resources. With improvements in habitat and cooperation from all sportfishing groups and businesses, Washington anglers can be given the opportunity to catch their salmon, and spend their dollars, right here at home.

By Bill Clarke,
Northwest Marine Trade Association.



ROLLIE SCHMITTEN, ASSISTANT ADMINISTRATOR FOR FISHERIES, NOAA

Follow-up Answer to Question by Representative Unsoeld

In what way does FACA impede full utilization of peer review in the development of a recovery plan?

In a strict sense, FACA does not impede utilization of peer review in the development of a recovery plan itself. Section 4(f) of the Endangered Species Act, which mandates the development and implementation of recovery plans, provides that:

The Secretary, in developing and implementing recovery plans, may procure the services of appropriate public and private agencies and institutions, and other qualified persons. Recovery teams appointed pursuant to this subsection shall not be subject to the Federal Advisory Committee Act.

16 U.S.C. §1533(f)(2). Recovery teams have been appointed by the Assistant Administrator of NMFS for both the development and continuing implementation of recovery plans. As part of this ongoing process, the Assistant Administrator may reconvene or reconstitute recovery teams as deemed necessary. Thus, to a large extent, FACA does not present a problem in developing and implementing recovery plans.

However, NMFS may undertake conservation and recovery measures outside the context of a formal recovery plan, in which case FACA may apply to any peer review on those measures. Such instances may arise prior to development of a recovery plan, or to address measures beyond the scope of, or not incorporated in, the recovery plan.

One example concerns the ongoing discussions relating to the district court decision in Idaho Dept. of Fish and Game v. NMFS, Civil No. 92-973-MA (D.C.Or. filed March 28, 1994), which involve a re-evaluation of the standard to determine whether an action jeopardizes listed Snake River salmon. These discussions do not directly relate to the recovery plan process, so that they are not exempt from FACA. In his decision, however, Judge Marsh suggested that non-Federal entities be involved in these discussions, specifically stating that "Federal defendants are under no legal obligation to listen and respond to salmon plans from every corner of the Northwest, but the ESA does impose substantive obligations with respect to an agency's consideration of significant information and data from well-qualified scientists such as the fisheries biologists from the states and tribes." The government's ability to incorporate these non-Federal entities in the decisionmaking process, as recommended by Judge Marsh, is certainly hampered by the requirements imposed by FACA.

BARBARA ROBERTS
GOVERNOR



OFFICE OF THE GOVERNOR
STATE CAPITOL
SALEM, OREGON 97310-0370
TELEPHONE (503) 378-3111
TDD (503) 378-4859

June 27, 1994

The Honorable Gerry E. Studds, Chairman
U.S. House of Representatives
Committee on Merchant Marine and Fisheries
Room 1334, Longworth House Office Bldg.
Washington, D.C. 20515-6230

Dear Chairman Studds:

Thank you for the opportunity to address your committee at its oversight hearing on the recovery of endangered Columbia River Basin salmon stocks on June 30th. Regrettably, I cannot be present in Washington D.C. on that date, and must observe that copies of the Snake River Salmon Recovery Team's final recommendations did not become available to us until late last week. I would nonetheless like the following observations shared with Committee members and included in the record of the hearing. Please understand that my inability to reschedule to attend does not indicate any lessening of the tremendous importance that I place on these issues, or their importance to Oregonians and to the region.

The recommendations of the Snake River Salmon Recovery Team present the region with a first outline of a salmon recovery plan specific to the listed Snake River species. Of course, the Northwest Power Planning Council's Strategy for Salmon, a comprehensive program that aims at all stocks in the Columbia Basin, should continue to be implemented while the work specific to the Snake River species is completed.

I commend the Team for its effort which has generated many sound ideas, but also must recognize that the Team's recommendations do not do the whole job. Unfortunately many concerned parties are now taking up sides supporting or opposing the team's recommendations. This complex resource management issue will be better served if we concentrate on completing the job of developing a Snake River Salmon Recovery Plan, and my brief description of three fundamental concerns is offered in that spirit.

First, the Team's recommendations are not assembled and presented within an analytical framework that demonstrates the efficacy of the elements, singly or

House Merchant Marine & Fisheries Committee
June 27, 1994
Page 2

collectively, in achieving recovery. We all anticipate that recovery of these salmon populations will be difficult and expensive. For a proposed recovery plan to be accepted and supported, it must be based on a clear, sound and convincing analysis that incorporates all significant life cycle factors and assesses the likely contribution of each to meeting a rebuilding schedule.

Second, I am deeply concerned that the Team's recommendations identify virtually no specific actions, other than the unproven strategy of massive barging, to be taken in the near term to avoid loss of these critically depressed salmon populations. The sudden drop in numbers of returning spring chinook salmon this year emphasizes the point that we have not been granted a grace period in which to conduct additional studies and evaluations before taking decisive action. The National Marine Fisheries Service cannot assemble a proposed recovery plan without addressing our most urgent order of business - actions needed over the next four to five years to be sure we have a base from which to work toward long term recovery.

Third, I must reiterate the deep concerns I expressed in comments on the draft the Team circulated earlier this year, particularly regarding its extensive reliance on transportation of juvenile fish by barge and truck as the primary solution to the substantial mortality caused by hydroelectric dams. A recent review by a panel of scientific experts assembled by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service was pointedly dubious that continued very heavy reliance on transportation could reverse the present decline of Snake River salmon.

The Team appears to disregard the level of risk to the salmon imposed by single-minded reliance on this controversial approach to dealing with dam mortality. The absence of such a risk analysis of the transportation strategy is another example of the lack of a structured analytical approach to frame the Team's recommendations. Further, the Team's reliance on transportation causes it to defer improvements to in-river migration conditions pending additional time consuming studies. Certainly we need improved data, but just as certainly improvements in survival conditions for river-migrating juveniles cannot wait for absolute knowledge.

Many individual elements of the Team's recommendations merit praise. The discussion and development of proposed recovery goals and delisting criteria appears soundly based and carefully considered. The review of measures to protect and restore spawning and rearing habitat puts an appropriate emphasis on protection and restoration of habitat. The Team has clearly taken an ecosystem management view in identifying the need to address a broad range of watershed activities and management practices, and deserves credit for these steps.

Finally, I wish to raise a process issue that has tremendous implications for our ultimate success in salmon recovery. Initial indications from the National Marine

06-28-94 09:27AM FROM GOVERNORS OFFICE

P04

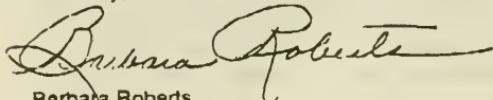
House Merchant Marine & Fisheries Committee
June 27, 1994
Page 3

Fisheries Service are that they will rapidly convert the team's recommendations into a draft recovery plan and circulate it for review. We are all anxious to have an adopted recovery plan in hand, but both substance and timing of the document are critical. The previous jeopardy standard for Snake River salmon used by NMFS has been rejected in federal court. A revised jeopardy standard and actions to achieve such a revised standard are therefore presently under development and are expected to be assembled by this fall. It would be wise for NMFS to integrate the information and analysis from that process into a draft recovery plan before circulating it for public review, and we urge NMFS to do so.

The State of Oregon remains committed to recovery of Snake River salmon and to the restoration of salmon runs throughout the Columbia Basin. We have and will continue to provide our information, expertise, and support to such efforts. I share the sense of urgency held by many others but I also believe that we must do this job to the best of our wisdom and ability. We can not afford a recovery plan which is only partially complete. Let's finish the job.

Thank you for your interest and your support.

Sincerely,



Barbara Roberts
Governor

cc: Senator Mark O. Hatfield
Senator Bob Packwood
Representative Elizabeth Furse
Representative Ron Wyden
Representative Peter DeFazio
Representative Mike Kopetski
Representative Bob Smith
Governor Mike Lowry
Governor Cecil Andrus
Doug Hall, NOAA
Gary Smith, NMFS, Seattle
Ed Sheets, Northwest Power Planning Council
Ted Hallock, Angus Duncan - NWPPC Oregon
Rod Ingram, ODFW



BOSTON PUBLIC LIBRARY



3 9999 05982 705 3

ISBN 0-16-045934-6



9 780160 459344

90000

